IDENTIFYING DYNAMIC KEY FACTORS IN UNIVERSITY DROPOUT AMONG CHILEAN ENGINEERING STUDENTS

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SUMMARY

The present study aims to identify key dynamic factors that influence the voluntary dropout decisions of university students, with a specific focus on engineering programs within the Latin American context. These factors are intended to support the early identification of students at risk of dropping out. The research process was structured into three stages: a literature review, semi-structured interviews with specialists in engineering education, and the evaluation conducted by an expert panel. After each stage, iterative refinements were conducted to the proposed set of factors. The final outcome comprised a set of 18 factors, which were positively assessed in terms of sufficiency, clarity, coherence, relevance, and absence of bias. This set was found to be consistent with key factors reported in the existing literature on university dropout, while also highlighting context-specific issues relevant to engineering education and the Latin American region. The results provide a solid foundation for the early detection of potential university dropout cases and for the design and implementation of effective and timely support interventions.

Introduction

University dropout constitutes a global issue characterized by multidimensional causes and consequences. According to UNESCO (2021), in Latin America and the Caribbean (LAC), approximately 50% of students who enter higher education do not complete their studies. This phenomenon generates consequences at the individual, family, institutional, social, and governmental levels.

At the individual level, students who drop out may encounter significant limitations in employment opportunities and professional development (Villegas and Núñez Lira, 2024). Within the family context, dropout may lead to frustration and financial losses,

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particularly in households that have made substantial efforts to finance their children's education (Montes de Oca Sánchez, 2021). From an institutional perspective, high dropout rates may reflect deficiencies in educational quality and in the effectiveness of student support systems (Moreno and Chiecher, 2019). At the societal level, dropout affects workforce professionalization and competitiveness, thereby influencing the economic development of a region or country (Villegas and Núñez Lira, 2024). Additionally, it may impact the allocation and management of public resources in countries that provide financial support through scholarships and educational benefits.

This issue is particularly evident in engineering programs, where high academic demands, limited perceived institutional support, and rigid curricular structures contribute to dropout rates that exceed those observed in other disciplines (Zhu *et al*., 2021). Additional contributing factors include insufficient prior preparation in mathematics and science, intensive academic workload, inadequate teaching strategies for facilitating the understanding of key concepts, and the absence of discipline-specific support programs (Moreno and Chiecher, 2019). Despite the recognized importance of this phenomenon, higher education institutions in Latin America often lack effective early detection systems for identifying students at risk of dropout. This limitation is largely attributable to the predominant focus of existing studies and measurement instruments on antecedent or background factors influencing dropout decisions. Such factors are frequently general in nature and not readily modifiable. This restricted perspective constrains both the comprehensive understanding of the phenomenon and the development of effective intervention strategies (Muñoz-Inostroza *et al*., 2024).

Maluenda *et al*. (2022) propose shifting the focus toward what they define as dynamic factors, grounded in interactionist models of university dropout. These factors influence the decision to withdraw and are susceptible to change throughout the university experience. Emphasizing these elements entails conceptualizing dropout as an interactionist process, in which continuous interaction between the educational system and students generates ongoing change. Furthermore, this perspective enables the implementation of periodic assessments targeting critical yet modifiable aspects of the phenomenon, thereby facilitating the design of strategic interventions and the efficient allocation of institutional resources.

Research on measurement instruments has frequently relied on established theoretical frameworks, such as Tinto's (1975) model. However, many studies either lack a clearly articulated theoretical foundation or apply these models in a limited or superficial manner (Díaz and Tejedor, 2017; Bäulke, Grunschel and Dresel, 2022). This lack of conceptual standardization restricts the ability to generate consistent conclusions regarding the phenomenon (Muñoz-Inostroza *et al*., 2024) and complicates comparisons across studies.

In light of the above, the objective of this study was to identify the dynamic factors associated with university dropout in engineering programs within the Chilean national context.

Interactionist models of university dropout

The term dropout refers to the interruption of studies without obtaining an academic degree or title. However, it is often used generically and frequently conflated with terms such as permanence, persistence, retention, and attrition, which are not synonymous.

Dropout can be classified into two types: voluntary, when the student decides to leave their studies due to personal or external factors, and involuntary, when the interruption results from academic, administrative, or financial problems (Tinto, 1975). This definition has been expanded to include interruptions of at least three consecutive terms at the same institution (Bean and Eaton, 2001). This distinction differentiates dropout from the concept of attrition, which originated in a military context and implies a lack of commitment on the part of the student, often without considering structural or contextual factors (Proyecto ALFA-GUIA, 2013).

Permanence refers to continued enrollment in studies until their completion. It is associated with factors such as a sense of belonging, social and academic integration, and access to resources that facilitate academic progress (Tinto, 1982). Persistence, in contrast, refers to the intention to continue studying despite difficulties. It is linked to self-efficacy, motivation, and perceived institutional support (Bean and Eaton, 2001). These perspectives differ from retention, which, like attrition, stems from an institutional and policy-oriented lens. It relates to institutional strategies and policies aimed at preventing dropout. Retention not only means that a student remains enrolled but also seeks to ensure the completion of studies in a successful manner (Himmel, 2002).

Interactionist models of university dropout are characterized by emphasizing the ongoing interaction between students and their environment, highlighting the dynamic and multifactorial nature of the dropout process. These models recognize that students' interactions with the institution (its processes, rules, and culture) and with people (peers, faculty, and staff) generate changes in their intentions, goals, and objectives, as well as in their academic and social skills. These changes create new conditions for navigating university life, which, in turn, continuously influence decisions regarding dropout or continuation. Within this framework, three main models have been particularly useful in the development of retention strategies.

Spady's model (1970) posits that a lack of social and academic integration within the university context can predict dropout. It includes factors such as academic performance, normative congruence between student and institutional values, and overall satisfaction with the university experience. Lower levels of integration lead to reduced motivation and commitment to the institution, thereby increasing the likelihood of dropout.

Tinto's model (1975, 1993) introduces a distinction between academic and social integration as key elements for persistence. Students are more likely to drop out when they fail to integrate at both levels. The model incorporates institutional experiences throughout the student's academic trajectory and emphasizes the importance of interpersonal relationships with faculty and peers as central factors for retention.

Lastly, Bean and Metzner's model (1985) focuses on non-traditional students—those who do not reside on campus, have work or family responsibilities, or depend more heavily on external factors. For these students, social integration has less impact, and continuation depends more strongly on factors such as financial support, curricular flexibility, and the perceived usefulness of their studies.

Dropout rates worldwide and in Latin America

Data from the Organization for Economic Cooperation and Development (OECD) indicate that graduation rates in higher education institutions vary significantly across countries. While some European nations reach completion rates above 70%, other regions face dropout levels exceeding 40% (OECD, 2017).

In developed countries, strategies to reduce dropout rates include academic tutoring programs, accessible funding, and inclusive education policies. However, in developing countries, these measures face structural limitations due to resource constraints and limited coverage within higher education systems.

UNESCO (2021) reports that 50% of the population aged 25 to 29 in Latin America and the Caribbean (LAC) who have accessed higher education have not completed their studies, either due to dropping out or because they remain enrolled. A systematic review that included articles in Spanish, Portuguese, and English published between 1992 and 2022 in peer-reviewed or indexed journals found that 75% of the articles were published after 2013, demonstrating a growing interest in the study of the phenomenon in the region (Chiarino *et al*., 2024). This trend reflects an increasing academic focus on this issue.

The review further indicates that 76% of the studies employed a quantitative methodology and that an equivalent proportion focused on dropout rather than retention. A total of 64 variables associated with dropout and persistence were identified, with the most frequently studied being students' academic trajectory in higher education, household income, gender, and prior academic trajectory in secondary education.

Dropout in engineering

Student dropout in engineering is a highly relevant issue due to the demanding academic requirements and the consequences it entails for both higher education institutions and the training of future professionals. Studies have highlighted the importance of analyzing both quantitative and qualitative evidence, emphasizing the significance of dynamic variables—understood as those that can fluctuate throughout the academic process and influence students' dropout intentions (Bahat *et al*., 2023; Mtshweni, 2021).

These variables are associated with socioeconomic, motivational, perceived institutional support, academic performance, and psychological factors (Zhu *et al*., 2021; Androulakis *et al*., 2021; Gallego *et al*., 2021; Jurado *et al*., 2023). More recent evidence further refines this perspective, indicating that self-efficacy, motivation, socioeconomic status, and mental health play a decisive role in the academic trajectory of engineering students (Zhu *et al*., 2021; Yılmaz and Sarpkaya, 2022).

From a quantitative perspective, an increasing number of studies have employed machine learning techniques and statistical models to identify students at higher risk of dropping out in the early stages of their academic trajectory (Girón *et al*., 2023; Zhang *et al*., 2021; Zhu *et al*., 2021). Qualitative approaches, including interviews and thematic analyses, have shown that feelings of isolation, stress, or uncertainty can weaken students' determination throughout their studies (Álvarez *et al*., 2020; Zhu *et al*., 2021; Maluenda *et al*., 2023). Conversely, positive effects have been associated with the development of collaborative networks and the implementation of personalized tutoring, which foster a stronger sense of community and reinforce students' confidence in facing the challenges of the program (Zapata, 2020; Bahat *et al*., 2023; Zhu *et al*., 2021).

Evidence from both quantitative and qualitative approaches suggests that dropout does not stem from a single cause but rather results from the interaction of individual, institutional, academic, and socioeconomic factors (Zhu *et al*., 2021). Given their evolving nature, dynamic variables may fluctuate throughout the academic period, thereby requiring targeted interventions at key moments (Bahat *et al*., 2023; Yılmaz and Sarpkaya, 2022).

Measurement instruments

There are various instruments designed to assess university dropout, each with different approaches and limitations. Among them is the Early University Dropout Intentions Questionnaire (EUDIQ-R), developed by Bernardo *et al*. (2022), which focuses on measuring early dropout intentions. It identifies emotional, motivational, and academic factors. The variables it considers include reasons for choosing a degree, students' prior knowledge, economic aspects, the student's academic situation, interest in the degree, degree of adaptation to university life, institutional factors, and elements related to self-regulated learning.

The College Persistence Questionnaire, developed by Davidson *et al*. (2009), focuses on assessing university persistence. It measures the intention to remain at the university and examines the factors influencing students' continuation within the institution. Its dimensions include academic and social integration, satisfaction with support services, commitment to completing the degree and to the institution, and academic self-awareness.

The WWH-dropout Scale, developed by Schmitt *et al*. (2020), measures underlying factors influencing university dropout decisions. This scale adopts a more comprehensive approach, considering academic, economic, psychosocial, and contextual factors. It includes variables such as academic performance, workload, financial difficulties, the need to balance work and study, personal motivation, emotional well-being, and the perceived level of perceived institutional support. It provides insight into both internal and external factors that contribute to dropout risk.

The CADESUN, created by Díaz and Tejedor (2017), seeks to identify patterns among students who drop out of university programs. It includes psychological, sociological, economic, organizational, and adaptation/integration factors. It considers variables such as support, persistence, family income, advising services, educational quality, satisfaction, and effort. As a result, it is useful for identifying which factor is most relevant within a specific population.

Finally, the screening instrument for students at risk of dropping out of higher education, developed by Casanova *et al*. (2021), aims to identify early signs of academic maladjustment. It incorporates factors such as satisfaction with education, academic exhaustion, and dropout intention, all assessed through 17 related items.

Although these instruments provide a reference framework for understanding dropout and developing intervention strategies, they are generally generic in terms of their application across different fields of study. They have often been applied superficially, without proper adaptation to specific contexts. This is problematic, as the motivations and factors associated with dropout intention can vary significantly by academic discipline or educational modality (Arancibia and Trigueros, 2018; SIES, 2021). This lack of specificity results in imprecise findings that do not adequately reflect the diversity of students' experiences (Muñoz-Inostroza *et al*., 2024).

Most instruments treat the factors as fixed states over time, even though they can change depending on students' accumulated experiences throughout their academic journey (Scheunemann *et al*., 2022; Bäulke *et al*., 2022). Current tools fail to capture this evolution, as they are limited to a specific point in time (Braxton, 2019). This leads to a disconnect between dropout intention and the moment when this intention materializes into an actual decision to leave university (Muñoz-Inostroza *et al*., 2024).

These instruments were developed in European or North American contexts, which means that the

variables and factors they consider may not be fully applicable to the realities of students in Latin America (Guzmán *et al*., 2021; Sáez *et al*., 2020). Additionally, they were created in English, creating a linguistic barrier when conducting studies in Spanish. This poses a significant challenge in terms of cultural validity, as these instruments fail to reflect the socioeconomic, educational, or cultural characteristics specific to the region (Muñoz-Inostroza *et al*., 2024).

The present study sought to delimit a set of key dynamic factors associated with voluntary university dropout in the Chilean engineering context. This was achieved through an unsystematic review of specialized literature, interviews with experts in engineering education, and an expert panel evaluation focused on university dropout.

Methodology

Sample

An unsystematic literature review was carried out, analyzing documents related to student dropout from both a global and Latin American perspective. Out of a total of 43 articles, 12 addressed the global context of university dropout, 18 focused on the Latin American and Caribbean context, and 13 discussed the general theoretical framework of the issue. The articles were analyzed to understand what has been studied to date, to identify the main factors considered for measuring dropout intention, and to determine which of those factors are dynamic.

Interviews with engineering education eanagers

Nine managers of engineering education were interviewed, selected based on their experience with academic processes in engineering education. The criteria included participants with five or more years of experience in managing teaching processes in engineering education, including experience with dropout issues or related data. The group included heads or former heads of academic programs (n = 1), academic unit administrators (n = 3), faculty/program directors (n = 2), and faculty teaching directors (n = 3).

The interviews were conducted in early April 2025 by project researchers, in person, and lasted approximately 30–45 minutes. Responses were recorded through written notes taken by the interviewers. The aim was to identify, based on the managers' experience, the most critical dropout variables and to distinguish those that are dynamic, later comparing them with the variables identified in the literature.

Expert panel evaluation

To evaluate the resulting set of variables, a panel of eight national and international experts was consulted to assess the relevance, sufficiency, clarity, coherence, and absence of bias of the factors emerging from the previous phases. This evaluation helped refine the preliminary battery by adjusting wording, reassessing relevance, and ensuring adequate conceptual coverage.

Design

This research follows a qualitative and exploratory approach, as its objective was to delimit a set of key dynamic factors linked to the phenomenon of voluntary student dropout within the Chilean engineering context. A sequential methodological strategy was used, integrating the literature review, interviews with experts, and an expert panel evaluation. Through this triangulation of sources, a preliminary set of factors was constructed and later subjected to qualitative analysis and expert assessment.

Instruments and Measures

Interview with engineering education managers

The interview was designed with an introductory section explaining the research project, followed by four open-ended questions. The criteria covered in the interview were: a) identification of key characteristics of dropout in engineering; b) identification of the most relevant causes of dropout observed in engineering programs; c) factors that most influence students' dropout decisions; and d) identification of aspects that are susceptible to modification. Responses were recorded through interviewers' notes and later compared with the information gathered through the literature review.

Expert panel evaluation

The evaluation form provided to the expert panel included the 17 dimensions that emerged from the literature review and that were cross-referenced with the engineering education specialist interviews, including the conceptual definitions for each dimension (Table I).

The experts were asked to evaluate each dimension based on clarity, coherence, sufficiency, relevance, and the absence of bias. Sufficiency was defined as the factor's capacity to fully address the intended dimension. Clarity referred to the comprehensibility of the conceptual component. Coherence evaluated the internal consistency of the factor's components and their connection to the overall construct. Relevance referred to the importance of the conceptual aspects in representing the construct. Bias was assessed in terms of the potential presence of distortion in any given aspect. Each expert rated every factor on these five criteria using a 3-point scale, ranging from 1 (does not meet the criterion) to 3 (fully meets the criterion).

Analysis

Unsystematic literature review

The articles were sourced from various academic publication platforms, such as Scopus, WoS, SciELO, and Google Scholar.

Articles were selected based on the following criteria: a) they explicitly stated that they addressed university dropout in engineering; b) they included at least one dynamic variable of university dropout among their variables of study; and c) they provided results related to or associated with dropout in engineering. Accordingly, the 43 selected documents provided relevant factors, dimensions, and/or variables for studying dropout in engineering from a dynamic perspective.

The selection of the factors identified in the documents was carried out independently by the seven researchers. The integrated document listing the factors was consolidated through work meetings, during which: (1) duplicate factors were removed; (2) the redundancy of different factors addressing the same aspect was evaluated; and (3) the dynamic nature of each factor—defined as its potential to change during the university process—was considered. From this analysis, the initial list of factors to be cross-referenced with the expert interviews was generated (Table I).

Interview with engineering education specialists

The notes taken during the interviews with specialists were analyzed using thematic content analysis. The interview texts were coded according to the different themes identified. Based on these codes, broader categories were established to represent the most frequently mentioned topics. Subsequently, a matching table was created (Table II) for the

TABLE I
INITIAL LIST OF EMERGING FACTORS FROM LITERATURE

Factor	Description
Academic Performance (3)	Academic outcomes of the student, reflected in grades and completion of educational activities
Dropout Intention (3)	Thoughts students have about "dropping out their study program" before completing it
Academic Overload (3)	Perception of excessive workload, demands, and volume of information to process
Academic Goals (2)	Personal objectives and purposes related to education and professional future
Coping Strategies (2)	Psychological mechanisms and resources to manage stress, frustration, and academic or personal difficulties
Self-Regulated Learning (2)	Skills to manage the study process, including planning, time management, and control over information load
Self-Efficacy in Mathematics (2)	Confidence in one's abilities to complete academic tasks and overcome challenges related to the program
Health Issues (2)	Students' physical and mental health status and treatment
Academic Engagement (3)	Level of involvement, motivation, and active commitment of the student to academic activities
Family Context (1)	Family environment and its influence on the student's academic experience
Sense of Belonging at University (1)	Feeling of integration and acceptance within the university environment
Economic Situation (1)	Financial conditions that may hinder academic progress
Satisfaction with the Program (3)	Degree of satisfaction with the quality and conditions of their academic training
Support Networks at University (1)	Social support received within the university context, including relationships with peers, tutors, and other academic community members

(1) Social and context components, (2) Individual components, (3) Outcome components.

factors considered in the battery: if any of the interviewees' comments were associated with a given factor, it was marked in the table in order to later calculate the frequency and percentage of mention for each dimension.

TABLE II
FREQUENCY TABLE OF COINCIDENCE FACTORS

Factor	Frequency	Percentage (%)
Dropout intention	10	12.82
Institutional treatment	7	8.97
Family context	6	7.69
University belonging	6	7.69
University support networks	5	6.41
Satisfaction with the career	5	6.41
Normative beliefs	5	6.41
Self-regulated learning	4	5.13
Academic engagement	4	5.13
Self-efficacy in mathematics	4	5.13
Health problems	4	5.13
Academic performance	4	5.13
Others	4	5.13
Economic situation	4	5.13
Coping strategies	2	2.56
Academic overload	2	2.56
Academic goals	2	2.56
Addictions	0	0.00
Substance use	0	0.00
Total	**78**	**100**

Expert panel evaluation

The evaluations provided by the expert judges on the five previously mentioned criteria were compiled into a database containing ratings per factor. This database was analyzed using descriptive statistics to assess the level of agreement among the judges for each factor according to the criteria, as well as to identify additional insights provided through open comments and suggestions.

Results

Literature review

The creation of the initial battery of factors affecting voluntary dropout intention consisted of an iterative process. From this initial review, a battery of 14 relevant dynamic factors identified in the literature was obtained (Table I).

Some notable aspects of the identified factors include the repeated consideration of external factors such as family context, health problems, economic situation, and social aspects, as well as elements more directly related to academic performance and student engagement. External aspects have been recognized as significant determinants in students' decisions to drop out, as they often impose direct limitations on the activities students must perform—such as having to work while studying, caring for family members, living at a physical distance from

their families, or experiencing illnesses that hinder their active participation in academic life.

Additionally, a division emerged among: (1) social and contextual factors related to students' immediate circles, such as support networks, family, and university integration; (2) individual factors, such as self-regulated learning, academic goals, coping strategies, and self-efficacy in mathematics; and (3) outcome factors, arising from the interaction between students and their university experience, such as academic performance, satisfaction with studies, and academic overload.

Interviews with experts in engineering education

From the interviews conducted with engineering education experts, key ideas and themes were collected regarding the characteristics of dropout commonly observed within faculties, associated causes, the most relevant aspects of the dropout phenomenon, and the factors considered modifiable or institutionally addressable.

Among the most frequently mentioned factors were dropout intention, perceived institutional support, family context, and sense of belonging at the university, which were predominant within the context of engineering. Most factors were mentioned by multiple experts, indicating agreement regarding their relevance to the engineering field. The "Others" category refers to responses from interviewees that indicated causes of dropout that did not align with any factor on the original list and were not mentioned by other specialists.

In addition to these overlaps, new elements specific to engineering education were proposed. Four additional aspects were incorporated: (a) perceived institutional support, (b) substance use, (c) addictions, and (d) normative beliefs (Table III).

It is important to note that although the literature referenced various issues related to perceived institutional support (e.g., poor interactions with faculty, administrative bureaucracy, inadequate university services), these aspects had not been previously addressed in a cohesive way that focused on the impact of student–institution interactions. Therefore, a new component was created, incorporating the interactional dynamics between students and institutions as emphasized in interactionist models. Substance use and addictions were not mentioned in the reviewed literature as relevant aspects, yet they were frequently raised by the specialists, thus justifying their inclusion.

Finally, normative beliefs were emphasized by the experts as particularly relevant in the case of engineering, where a substantial gap between expectations and objective conditions often leads to high levels of student frustration. As a result, the final battery comprised 18 definitive factors to be evaluated by university dropout experts.

Expert panel evaluation

To report the expert panel's analysis, an agreement table (Table IV) was developed based on the percentage of agreement and the coefficient of variation.

All criteria were positively evaluated by the judges in terms of sufficiency, clarity, coherence, and relevance, with only minor variation between judges. Regarding bias, general agreement was lower across all dimensions, mainly due to language use. Comments included criticism of the predominant use of masculine terms in phrasing (e.g., using "compañero" instead of "compañero/a"). This issue was addressed by revising the language to ensure gender-inclusive terminology.

Discussion and Conclusions

The findings of this study contribute to advancing the understanding of dynamic factors that influence voluntary dropout decisions among university students, particularly within engineering programs in Chile.

First, a strong convergence is observed between the identified factors and those reported in the specialized literature, highlighting the theoretical and empirical validity of the final set. Variables such as self-efficacy, academic overload, mental health, sense of university belonging, and financial situation have been widely described in previous research as key components related to college dropout (Zhu *et al*., 2021; Mtshweni, 2021; Yılmaz and Sarpkaya, 2022; Maluenda-Albornoz *et al*., 2022; Jurado *et al*., 2023).

The consistency between these findings and those of this study reinforces the relevance of the selected factors and confirms that this set of variables aligns with the main body of research on higher education dropout. In keeping with the present study's objective, the contribution of this research focuses on specifying a Spanish-language, context-sensitive factor set for engineering, providing conceptual clarity and content boundaries that can guide subsequent instrument development, rather than on testing a finalized scale.

Nevertheless, this study also introduces novel contributions that enrich the approach to the dropout phenomenon from a contextualized and dynamic perspective. Specifically, the inclusion of factors such as normative beliefs and perceived institutional support addresses dimensions that have received limited attention in prior instruments but

TABLE III
EMERGING FACTORS BASED ON INTERVIEWS WITH SPECIALISTS

Factor	Description
Perceived institutional support (1)	Experiences related to the quality of interaction between students and the university institution such as relations with teachers, assistants, secretaries, administrative staff, university services, etc.
Substance use (1)	Use or consumption of legal and/or illegal substances that may affect the student's performance and/or behavior during their studies.
Addictions (1)	Dependence on harmful activities for the students that affect their health or academic development, such as gambling or excessive social media use.
Normative beliefs (2)	Expectations, social and academic norms that students internalize about their performance and academic trajectory.

(1) Social and context components, (2) Individual components, (3) Outcome components.

TABLE IV
AGREEMENT PERCENTAGE AND COVARIATION COEFFICIENTS FOR EACH FACTOR

Factor	Sufficiency		Clarity		Coherence		Relevance		Bias	
	Agreement (%)	Var. Coef. (%)	Agreement (%)	Var. Coef. (%)	Agreement (%)	Var. Coef. (%)	Agreement (%)	Var. Coef. (%)	Agreement (%)	Var. Coef. (%)
1. Academic performance	95.83	12.30	95.83	8.63	100.00	0.00	100.00	0.00	91.67	25.71
2. Dropout intention	87.50	19.72	94.17	8.82	96.67	6.38	90.83	12.37	91.67	25.71
3. Academic overload	95.83	12.30	93.06	8.29	96.53	5.27	95.83	8.63	90.97	25.69
4. Academic goals	91.67	16.83	95.83	9.30	98.96	2.98	94.79	8.05	91.67	25.71
5. Coping strategies	100.00	0.00	95.83	5.10	99.11	2.55	98.21	5.14	91.37	25.68
6. Self-regulated learning	100.00	0.00	97.92	2.01	100.00	0.00	100.00	0.00	91.67	25.71
7. Self-efficacy in mathematics	95.00	12.30	92.50	10.51	99.17	2.38	90.00	25.96	89.17	25.88
8. Health issues	95.83	12.30	92.36	8.47	100.00	0.00	98.61	3.98	100.00	0.00
9. Academic engagement	100.00	0.00	96.09	6.39	98.70	2.51	98.70	2.51	90.89	25.70
10. Normative beliefs	95.83	12.30	99.17	2.38	100.00	0.00	95.00	10.44	91.67	25.71
11. Family context	100.00	0.00	95.83	4.10	100.00	0.00	98.61	3.98	91.67	25.71
12. University support networks	100.00	0.00	99.17	2.38	100.00	0.00	100.00	0.00	89.17	26.49
13. University belonging	100.00	0.00	99.17	2.38	97.50	5.09	99.17	2.38	90.0	25.96
14. Economic situation	100.00	0.00	91.67	11.22	100.00	0.00	100.00	0.00	95.83	12.30
15. Satisfaction with the career	100.00	0.00	96.35	6.30	100.00	0.00	91.15	25.68	91.67	25.71
16. Perceived institutional support	100.00	0.00	99.48	1.48	97.92	6.02	97.92	6.02	91.15	25.68
17. Substance use	100.00	0.00	97.92	3.94	98.61	3.98	100.00	0.00	91.67	25.71
18. Addictions	87.50	28.34	97.92	6.02	100.00	0.00	100.00	0.00	91.67	25.71

were consistently emphasized by the interviewed specialists.

Normative beliefs—understood as internalized expectations and standards related to academic performance—were associated in expert interviews with high levels of frustration when misaligned with the real conditions of the university environment. This is particularly evident in engineering, where an "idealized image of the study program" often collapses under academic pressure and disconnection from the institutional setting (Maluenda *et al*., 2023). Meanwhile, perceived institutional interactions (both positive and negative)—referred to through expressions such as "impersonal relations" or "not feeling heard"—encompass diverse experiences of student–institution interaction that directly impact students' sense of belonging and well-being.

These findings are especially relevant considering that most available instruments used to study university dropout have focused on structural variables, sociodemographic backgrounds, or general academic aspects, often overlooking relational or symbolic elements such as those identified in this study (Muñoz-Inostroza *et al*., 2024).

Instruments such as the CADESUN (Díaz and Tejedor, 2017) or the College Persistence Questionnaire (Davidson *et al*., 2009) address dimensions related to perceived institutional support, but typically from a more functional rather than experiential standpoint. In this context, incorporating factors such as normative beliefs and perceived institutional interactions broadens the understanding of dropout, recognizing that it is not solely explained by lack of resources or poor performance, but also by how students relate to institutional culture, their personal expectations, and the responses they receive from the university.

This perspective is consistent with interactionist models of dropout, which emphasize academic and social integration as central elements in students' academic journeys (Tinto, 1993; Bean and Eaton, 2001). These contributions allow for the development of more sensitive explanatory and predictive models that better capture students' subjective experience, particularly in disciplines like engineering, where academic pressure and lack of support mechanisms can exacerbate feelings of institutional detachment (Zhu *et al*., 2021; Maluenda-Albornoz *et al*., 2022).

Given the study's aim of delimiting dynamic, intervention-amenable factors to guide subsequent instrument development, operationalization should privilege proximal, change-sensitive indicators.

In practical terms, this conceptual refinement directly informs the design of items that capture day-to-day student–institution experiences (e.g., responsiveness of services, clarity of procedures, expectation–demand alignment), so that measurement focuses on proximal, dynamic constructs rather than only distal or static attributes.

In terms of theoretical coherence, the identified factors closely align with the main propositions of interactionist frameworks, such as those proposed by Tinto (1975, 1993), Spady (1970), and Bean and Metzner (1985). These models assert that dropout is not solely a result of individual or structural factors but rather emerges from the ongoing interaction between the student and their institutional and social context. In this sense, the study captures dynamic variables—those that evolve over the course of the academic experience and are therefore amenable to intervention (Maluenda-Albornoz *et al*., 2022).

This represents a meaningful shift from models focused exclusively on static or demographic antecedents (Muñoz-Inostroza *et al*., 2024). Moreover, the inclusion of dropout intention as an early predictor of eventual dropout (Maluenda-Albornoz *et al*., 2022) strengthens the potential utility of the proposed factors.

The coherence between the dynamic factors identified in this study and the core tenets of interactionist models reinforces the need to adopt theoretical approaches that acknowledge the processual nature of university dropout. As noted in prior work, many currently used instruments tend to focus on pre-entry variables or immutable characteristics, limiting their effectiveness for guiding timely interventions.

In contrast, the models proposed by Tinto (1993) and Bean and Eaton (2001), as revisited in recent studies such as Maluenda-Albornoz *et al*. (2022), emphasize the importance of tracking evolving factors during students' academic experiences, including social integration, perceived institutional support, and academic motivation. This perspective highlights the value of monitoring change-sensitive variables throughout the academic trajectory.

Including dimensions such as dropout intention, sense of belonging, and coping strategies within this set of factors reflects a more updated and functional understanding of dropout, as these variables not only explain the phenomenon but also offer concrete avenues for institutional action. In this way, the proposed set of variables supports the development of preventive models and instruments that are more sensitive to students' timing, context, and individual trajectory, consistent with recent recommendations in Latin American higher education research (Maluenda-Albornoz *et al*., 2022; Muñoz-Inostroza *et al*., 2024).

To ensure fidelity to the objective of delimiting factors for instrument development, an iterative item-development pipeline—encompassing cognitive interviews, expert review, and pilot testing—should be implemented to preserve sensitivity to change across the first academic year.

From a disciplinary perspective, the study also highlights features specific to the field of engineering. For example, self-efficacy in mathematics emerges as a key factor in shaping academic confidence and students' capacity to handle program demands (Zhu *et al*., 2021). In addition, the absence of adequate vocational guidance and the prevalence of doubts regarding career choice are central drivers of dropout intention (Portal Martínez *et al*., 2022). These findings support the idea that in highly demanding academic environments, such as engineering, the misalignment between initial expectations and academic realities can lead to significant demotivation and emotional strain.

The qualitative analysis of expert interviews also identified emergent factors not included in the initial literature review, such as substance use and behavioral addictions. These factors—frequently cited by engineering specialists—point to psychosocial dimensions that may significantly affect students' academic pathways. Their repeated appearance in expert discourse suggests that problematic consumption or addictive behaviors—such as excessive use of social media or gaming—can interfere with concentration, time management, and academic performance, while also impacting emotional stability. Furthermore, these factors may reflect specific contextual pressures, such as academic overload, performance anxiety, or a lack of support networks, highlighting their potential as risk indicators in demanding educational environments like engineering. These findings are aligned with those of Zhu *et al*. (2021) and Maluenda *et al*. (2023), who stress the importance of considering dynamic variables that affect student well-being across the academic trajectory. Integrating such dimensions into dropout analysis enhances the understanding of this complex phenomenon and informs the development of more comprehensive explanatory models.

Finally, the expert panel's evaluation of this set of factors yielded high levels of agreement across all assessed criteria, with consensus ranging from 90% to 100% in terms of sufficiency, clarity, coherence, relevance, and absence of bias. This validation process enabled substantial improvements in item wording and conceptual precision, reducing ambiguity and optimizing the coverage of each factor.

In practical terms, and conditional on subsequent validation, potential applications include short, periodic screenings during the first academic year; expectation-alignment activities during onboarding; targeted micro-remediation to strengthen mathematics self-efficacy; redesign of student-facing services to enhance perceived institutional support; and peer-mentoring to reinforce belonging. These uses align with the study's objective because they derive directly from the delimited dynamic factors and are intended to guide future instrument development and implementation, rather than to claim immediate diagnostic readiness.

In conclusion, this study resulted in the development of a set of dynamic dropout-related factors, constructed in Spanish and tailored to the Chilean engineering context. Unlike other approaches used in the region—which often rely on translations of English-language models and focus on general or retrospective factors—this proposal draws from both empirical evidence and expert knowledge grounded in higher education practice. As such, the resulting set of factors represents a significant step toward early dropout risk assessment and the implementation of more relevant and effective intervention strategies.

One of the main limitations of this study is its disciplinary scope, which is restricted to engineering programs. This may hinder the immediate generalization of the selected variables to other academic fields with different training dynamics. Another relevant limitation concerns the exclusive use of interviewer-generated notes, without audio recordings or verbatim text transcripts. This implies that non-linguistic features of participants' discourse (e.g., emphasis, tone, pauses) were omitted from the analysis, and that judge triangulation of the collected information was thereby constrained. Additionally, the interviews did not incorporate quality-control mechanisms for the analysis, such as investigator triangulation, participant validation (member checking), or the comparison of emergent categories across different groups of experts. This absence reduces the robustness of the information gathered.

The developed factor set represents a promising tool for the early identification of students at high risk of

dropping out within engineering programs. Its focus on dynamic variables and its contextual adaptation to the Chilean context make it a valuable resource for academic teams, student support services, and institutional leaders. In future applications, its systematic use may enable the identification of critical patterns early in the academic journey, supporting the design of timely and targeted interventions. Furthermore, its potential adaptation to other disciplines opens pathways for comparative research and cross-validation that may contribute to the development of more context-sensitive and effective retention policies. To facilitate cross-disciplinary adaptation, it is recommended to document item pools, factor definitions, and decision rules in open appendices, enabling transparent replication and iterative refinement across institutions.

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REFERENCES

Álvarez N, Callejas Z, Griol D (2020) Predicting computer engineering students' dropout in Cuban higher education with pre-enrollment and early performance data. *Journal of Technology and Science Education 10*: 241–258. https://doi.org/10.3926/jotse.922.

Androulakis G, Georgiou D, Kiprianos P, Stamelos G (2021) Examining the sequence of factors affecting students' tendency to drop out: A case study in Greece. *International Journal of Education 12*: 107–131. https://doi.org/10.5296/ije.v12i4.17835 .

Arancibia R, Trigueros C (2018) Aproximaciones a la deserción universitaria en Chile. *Educação e Pesquisa 44*: e177457. https://doi.org/10.1590/S1678-4634201708165743.

Bahat İ, Ernas S, Işık M (2023) The phenomenon of voluntary dropout: An investigation into management information systems students. *Pegem Journal of Education and Instruction 13*: 330–343. https://doi.org/10.47750/pegegog.13.04.38.

Bäulke L, Grunschel C, Dresel M (2022) Student dropout at university: A phase-oriented view on quitting studies and changing majors. *European Journal of Psychology of Education 37*: 853–876. https://doi.org/10.1007/s10212-021-00557-x.

Bean JP, Eaton SB (2001) The psychology underlying successful retention practices. *Journal of College Student Retention: Research, Theory & Practice 3*: 73–89. https://doi.org/10.2190/6R55-4B30-28XG-L8U0.

Bean JP, Metzner BS.(1985) A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research 55*: 485–540. https://doi.org/10.3102/00346543055004485.

Bernardo AB, Esteban M, Cervero A, Tuero E, Herrero FJ (2022) Validation of the Early University Dropout Intentions Questionnaire (EUDIQ-R). *Journal of Higher Education Theory and Practice 22*: 153–170. https://doi.org/10.33423/jhetp.v22i10.5384.

Braxton JM (2019) Leaving college: Rethinking the causes and cures of student attrition by Vincent Tinto (review). *Journal of College Student Development 60*: 129–134. https://doi.org/10.1353/csd.2019.0012.

Casanova JR, Assis Gomes CM, Bernardo AB, Núñez JC, Almeida LS (2021) Dimensionality and reliability of a screening instrument for students at-risk of dropping out from higher education. *Studies in Educational Evaluation 68*: 100957. https://doi.org/10.1016/j.stueduc.2020.100957.

Chiarino N, Rodríguez Enríquez C, Curione K, Machado A, Bonilla M, Aspirot L, Garófalo L, Olveira B (2024) Abandono y permanencia estudiantil en universidades de Latinoamérica y el Caribe: Una revisión sistemática mixta. *Actualidades Investigativas en Educación 24*: 1–37. https://doi.org/10.15517/aie.v24i2.57306.

Davidson WB, Beck HP, Milligan M (2009) The College Persistence Questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development 50*: 373–390. https://doi.org/10.1353/csd.0.0079.

Delgado Y, Esteban I, Pérez P, Vélez S (2024) The process of adaptation to higher education studies and its relation to academic dropout. E*uropean Journal of Education 59*: e12650. https://doi.org/10.1111/ejed.12650.

Díaz P, Tejedor de León A (2017) El CADESUN: Un instrumento para analizar la deserción estudiantil universitaria. *REencuentro. Análisis de Problemas Universitarios 28*: 199–216. https://reencuentro.xoc.uam.mx/index.php/reencuentro/article/view/844/804.

Gallego M, Cobos A, Gallego J (2021) Identifying students at risk to academic dropout in higher education. *Education Sciences 11*: 427. https://doi.org/10.3390/educsci11080427.

Girón DA, Rosas JS, Rodríguez WM, Susanibar-Ramírez E (2023) Predicting student dropout based on machine learning and deep learning: A systematic review. *EAI Endorsed Transactions on Scalable Information Systems 10*: e2. https://doi.org/10.4108/eetsis.3586.

Guzmán A, Barragán S, Cala F (2021) Dropout in rural higher education: A systematic review. *Frontiers in Education 6*: 727833. https://doi.org/10.3389/feduc.2021.727833.

Heublein U (2014) Student drop-out from German higher education institutions. *European Journal of Education 49*: 497–513. https://doi.org/10.1111/ejed.12097.

Himmel E (2002) Modelos de análisis de la deserción estudiantil en la educación superior. *Calidad en la Educación 17*: 91–108. https://www.calidadenlaeducacion.cl/index.php/rce/article/view/409.

Jurado D, Guevara C, Ayala-Gavilanes C, Lliguisupa-Pastor M (2023) The school dropout: Causes and effects in university education. *Journal of Higher Education Theory and Practice 23*: 115–125. https://doi.org/10.33423/jhetp.v23i18.6629.

Maluenda-Albornoz J, Infante-Villagrán V, Chacano Osses D, Gaete Cser D, Galve González C (2022) Integración social en la universidad durante la pandemia: Predictores de la intención de abandono en estudiantes de primer año. *Revista de la Educación Superior 51*: 101–116. https://doi.org/10.36857/resu.2022.204.2282.

Maluenda-Albornoz J, Infante-Villagrán V, Galve-González C, Flores-Oyarzo G, Berríos-Riquelme, J. (2022) Early and dynamic socio-academic variables related to dropout intention: A predictive model made during the pandemic. *Sustainability 14*: 831. https://doi.org/10.3390/su14020831.

Maluenda-Albornoz J, Bazignan-Guerrero C, Rojas-Retamal X (2022) Belonging to engineering during the first year in online education. En: *2022 41st International Conference of the Chilean Computer Science Society (SCCC)*. IEEE. Santiago, Chile, pp 1–6. https://doi.org/10.1109/SCCC57464.2022.10000341.

Maluenda-Albornoz J, Berríos-Riquelme J, Infante-Villagrán V, Lobos-Peña K (2023) Perceived social support and engagement in first-year students: The mediating role of belonging during COVID-19. *Sustainability 15*: 597. https://doi.org/10.3390/su15010597.

Montes de Oca Sánchez T (2021) Educación superior: Factores económicos que inciden en la deserción escolar. Caso de las licenciaturas de la UNID Tlalnepantla. *RIDEP. Revista Iberoamericana para la Investigación y el Desarrollo Educativo 12*: e1061. https://doi.org/10.23913/ride.v12i23.1061.

Moreno JE, Chiecher AC (2019) Abandono en carreras de ingeniería: Un estudio de los aspectos académicos, socio-demográficos, laborales y vitales. *Cuadernos de Investigación Educativa 10*: 73–90. https://doi.org/10.18861/cied.2019.10.2.2908.

Muñoz-Inostroza K, López-Ángulo Y, Sáez-Delgado F, Pinto-Vigueras J, Melo-Moreno P, Bernardo A (2024) Measuring dropout intention in college students: A systematic literature review. *Journal of Higher Education Theory and Practice 24*: 20–33. https://articlegateway.com/index.php/JHETP/article/view/7019.

Mtshweni B (2022) Adjustment and socioeconomic status: How do these factors influence the intention to drop out of university? *South African Journal of Psychology 52*: 262–274. https://doi.org/10.1177/00812463211058382.

OECD (2017) *Education at a Glance 2017: OECD indicators*. OECD Publishing. Paris, France. https://doi.org/10.1787/eag-2017-en.

Orozco-Rodríguez C (2022) Factores que influyen en el abandono escolar de la licenciatura en Matemáticas de la Universidad de Guadalajara. *Revista Mexicana de Investigación Educativa 27*: 259–287. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-66662022000100259.

Portal Martínez E, Arias Fernández E, Lirio Castro J, Gómez Ramos JL (2022) Fracaso y abandono universitario: Percepción de los(as) estudiantes de Educación Social de la Universidad de Castilla-La Mancha. *Revista Mexicana de Investigación Educativa 27*: 289–316. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-66662022000100289.

Proyecto ALFA-GUIA (2013) *Tendencias recientes en el estudio del abandono en la educación superior*. Red GUIA. https://www.researchgate.net/publication/266475186_Estudio_

sobre_Politicas_Nacionales_sobre_el_abandono_en_la_Educacion_Superior_en_los_paises_que_participan_en_el_Proyecto_ALFA_GUIA.

Sáez F, López Y, Cobo R, Mella J (2020) Revisión sistemática sobre intención de abandono en educación superior. *Congresos CLABES*. Bogotá D.C, Colombia. pp. 91–100. https://revistas.utp.ac.pa/index.php/clabes/article/view/2628.

Scheunemann A, Schnettler T, Bobe J, Fries S, Grunschel C (2022) A longitudinal analysis of the reciprocal relationship between academic procrastination, study satisfaction, and dropout intentions in higher education. *European Journal of Psychology of Education 37*: 1141–1164. https://doi.org/10.1007/s10212-021-00571-z.

Schmitt M, Moralles HF, Takayanagui AM (2021) WWH-dropout scale: When, why and how to measure propensity to drop out of undergraduate courses. *Journal of Applied Research in Higher Education 13*: 1152–1175. https://doi.org/10.1108/JARHE-09-2019-0242.

SIES—Servicio de Información de Educación Superior (2022) *Retención de 1er año de pregrado. Cohortes 2017–2021*. Subsecretaría de Educación Superior, Gobierno de Chile. https://www.mifuturo.cl/wp-content/uploads/2022/09/Retencion_Pregrado_2022_SIES.pdf.

Spady WG (1970) Dropouts from higher education: An interdisciplinary review and synthesis. I*nterchange 1*: 64–85. https://doi.org/10.1007/BF02214313.

Tinto V (1975) Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research 45*: 89–125. https://doi.org/10.3102/00346543045001089.

Tinto V (1982) Limits of theory and practice in student attrition. *The Journal of Higher Education 53*: 687–700. https://doi.org/10.1080/00221546.1982.11780504.

Tinto V (1993) *Leaving college: Rethinking the causes and cures of student attrition.* 2nd ed. University of Chicago Press. Chicago, Illinois, USA. 312 pp.

UNESCO (2021) De los efectos de la pandemia COVID-19 sobre la deserción universitaria: Desgaste docente y bienestar psicológico estudiantil. *Educación Superior y Sociedad 33*: 402–421. https://doi.org/10.54674/ess.v33i2.360.

Villegas BR, Núñez Lira LA (2024) Factores asociados a la deserción estudiantil en el ámbito universitario: Una revisión sistemática 2018–2023. *RIDE. Revista Iberoamericana para la Investigación y el Desarrollo Educativo 14*: e1923. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2007-74672024000100671.

Yılmaz T, Sarpkaya R (2022) A case study on university dropout: Perspectives from education faculty students and academicians. *Research in Educational Administration & Leadership 7*: 519–559. https://doi.org/10.30828/real.1163503.

Zapata, S. (2020) Percepciones de la tutoría de compañeros en una universidad en Chile. *Magis, Revista Internacional de Investigación en Educación 12*: 21–38. https://doi.org/10.11144/Javeriana.m12-25.pptu.

Zhang H, Apeanti WO, Akuamoah SW, Yaro D, Georgescu P (2021) A mathematical view towards improving undergraduate student performance and mitigating dropout risks. *Nonlinear Analysis: Modelling and Control 26*: 842–860. https://doi.org/10.15388/namc.2021.26.24120.

Zhu L, Sun S, Topoleski L, Eggleton C, Ma R, Madan D (2021) Evaluation of STEM engagement activities on the attitudes and perceptions of mechanical engineering S-STEM scholars. *Journal of Biomechanical Engineering 143*: 031004. https://doi.org/10.1115/1.4051715.

IDENTIFICACIÓN DE FACTORES DINÁMICOS CLAVE EN LA DESERCIÓN UNIVERSITARIA DE ESTUDIANTES DE INGENIERÍA CHILENOS

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RESUMEN

El presente estudio tiene como objetivo identificar los factores dinámicos clave que influyen en las decisiones voluntarias de abandono universitario de estudiantes, con un enfoque específico en los programas de ingeniería dentro del contexto latinoamericano. Estos factores están destinados a apoyar la identificación temprana de estudiantes en riesgo de abandonar sus estudios. El proceso de investigación se estructuró en tres etapas: una revisión de la literatura, entrevistas semiestructuradas con especialistas en educación en ingeniería y la evaluación realizada por un panel de expertos. Después de cada etapa, se realizaron refinamientos iterativos al conjunto propuesto de factores. El resultado final comprendió un conjunto de 18 factores, los cuales fueron evaluados positivamente en términos de suficiencia, claridad, coherencia, pertinencia y ausencia de sesgo. Este conjunto se encontró consistente con los factores clave reportados en la literatura existente sobre abandono universitario, al tiempo que destacó problemáticas específicas del contexto relevantes para la educación en ingeniería y la región latinoamericana. Los resultados proporcionan una base sólida para la detección temprana de posibles casos de abandono universitario y para el diseño e implementación de intervenciones de apoyo eficaces y oportunas.

IDENTIFICAÇÃO DE FATORES DINÂMICOS-CHAVE NA EVASÃO UNIVERSITÁRIA ENTRE ESTUDANTES DE ENGENHARIA CHILENOS

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RESUMO

O presente estudo tem como objetivo identificar os fatores dinâmicos-chave que influenciam as decisões voluntárias de evasão universitária de estudantes, com foco específico nos cursos de engenharia no contexto latino-americano. Esses fatores destinam-se a apoiar a identificação precoce de estudantes em risco de abandonar seus estudos. O processo de pesquisa foi estruturado em três etapas: uma revisão da literatura, entrevistas semiestruturadas com especialistas em educação em engenharia e a avaliação realizada por um painel de especialistas. Após cada etapa, foram realizados refinamentos iterativos no conjunto proposto de fatores. O resultado final compreendeu um conjunto de 18 fatores, os quais foram avaliados positivamente em termos de suficiência, clareza, coerência, relevância e ausência de viés. Esse conjunto mostrou-se consistente com os principais fatores reportados na literatura existente sobre evasão universitária, ao mesmo tempo em que destacou questões específicas do contexto relevantes para a educação em engenharia e para a região latino-americana. Os resultados fornecem uma base sólida para a detecção precoce de possíveis casos de evasão universitária e para o desenho e a implementação de intervenções de apoio eficazes e oportunas.