

STUDY OF ACADEMIC BURNOUT SYNDROME IN STUDENTS OF ENGINEERING IN ADMINISTRATION AND ENGINEERING IN BUSINESS MANAGEMENT AT THE ZACATEPEC INSTITUTE OF TECHNOLOGY

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Abstract – In order to identify and analyze the possible symptoms and triggers of Academic Burnout Syndrome (ABS) in higher education students and how this could affect their academic performance, a study was conducted at the Zacatepec Institute of Technology (ITZ), which is part of the Federal Technological Institutes belonging to the National Technological Institute of Mexico (TecNM). The study was conducted on a sample of 100 students from different semesters of the Engineering in Administration (IADM) and Engineering in Business Management (IGEM) programs using non-probabilistic convenience sampling during the school year covering a six-month period from January to June 2024. The most widely accepted measurement tool for assessing SBA, called the Maslach Burnout Inventory-Student Survey (MBI-SS), was applied. It consists of 15 items designed to assess the dimensions of Emotional Exhaustion, Cynicism or Depersonalization, and Academic Efficacy. The results of the MBI-SS showed moderate to very low levels of burnout in 86% of the study sample, while the remaining 14% showed high and very high levels of the syndrome in question. The relevance of conducting periodic research in this field to highlight and monitor this phenomenon is analyzed, with the aim of designing relevant and effective prevention and intervention strategies that favor students' academic performance.

Keywords-- Academic Burnout, Students, Higher Education, Academic Performance.

Abstract -- In order to identify and analyze the possible symptoms and triggering factors of Academic Burnout Syndrome (ABS) in higher education students and how this could impact their academic performance, a study was carried out at the Zacatepec Technological Institute (ITZ), which is part of the Federal Technology system belonging to the National Technology of Mexico (TecNM). The study was carried out on a sample of 100

students from different semesters of Engineering in Administration (IADM) and Engineering in Business Management (IGEM) through non-probabilistic convenience sampling, during the school year that covered a semester period from January to June 2024, with the application of the most accepted measurement instrument to evaluate SBA, called "Maslach Burnout Inventory-Student Survey (MBI-SS)", which consists of 15 items designed to evaluate the dimensions of Emotional Exhaustion, Cynicism or Depersonalization, and Academic Efficacy. The results with the application of the MBI-SS showed levels of burnout from moderate to very low in 86% of the study sample, while the rest of the 14% manifested high and very high levels of the syndrome in question. The relevance of conducting periodic research in this field to demonstrate and monitor the aforementioned phenomenon is analyzed, in order to design relevant and effective prevention and intervention strategies that favor the academic performance of students.

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INTRODUCTION

Higher education in Mexico, in all its sectors and modalities, constantly faces different challenges and obstacles. Among these, this study highlights low academic performance, which can lead to failure and temporary or permanent dropout, represented by the inability of students to complete their studies in a comprehensive and formal manner, as conceived in higher education, by obtaining a certificate of studies, degree, and professional license, thereby preventing the training of more and better professionals prepared to face the challenges of today's society and thus have greater opportunities for success in the workplace.

In today's society, particularly in the field of education, it is common to talk about stress, exhaustion, and

work addiction. In addition to these characteristics, there is also "Academic Burnout Syndrome (ABS)," characterized by exhaustion that affects the ability and motivation related to studying, causing poor academic performance that physically and mentally affects other aspects of the student's life, manifested in three dimensions: emotional exhaustion, depersonalization or cynicism, and lack of personal fulfillment, according to Ardiles et al. [1].

Studies conducted at several higher education institutions in Mexico before, during, and after the COVID-19 pandemic consistently revealed the presence of the syndrome, with higher levels and greater repercussions during the pandemic, as demonstrated in a study conducted by Llanes et al. [2] at the South Campus of the Autonomous University of Tamaulipas, during online classes due to the pandemic lockdown, where the results showed that 18% of university students presented with BS, and the most affected dimension was emotional exhaustion.

The training of excellent professionals involves processes that place high academic demands on students, such as acceptance within the group environment, complex learning processes and tools, rigorous exams, academic performance, overload of work in and outside of class, time pressure, competition among peers, among other factors, which can generate stress or negatively affect their psychosocial well-being and, as a consequence, their mental health. Depending on each student's cognitive and intellectual abilities, as well as their particular cultural and socioeconomic characteristics, the way in which they can cope with such academic demands will vary, and these demands may ultimately facilitate or hinder SBA, as explained by Salanova, cited by Caballero et al. [3]. Added to this situation are the consequences that the COVID-19 pandemic has left on the world, the country, and students in particular, compromising their health and physical and mental integrity due to economic and social instability caused by changes in habits, customs, and ways of relating to one another, which together constituted greater obstacles to dealing with them in the educational context, making it one of the most vulnerable areas for the emergence of SB. For this reason, in their research, Menghi et al. [2] point out that it is essential for educational institutions to intervene in a timely manner when alterations are present in both students and teachers.

It is well known that many students manage to develop the necessary skills during their education that help them achieve their academic goals, while other young people experience difficulties that are only reflected in indicators of poor performance and high dropout rates. In the latter situation, students generally experience high levels of stress during their education, with some

of them manage to develop appropriate strategies to cope with academic demands, while others do not and feel unable to change the problematic situation, which results in the use of escape or avoidance behaviors as coping mechanisms that are not necessarily appropriate.

In studies conducted to identify the root causes of the aforementioned problems in the educational context, several have considered SBA to be one of the main causes that have significantly influenced the poor academic performance of students, leading to school dropout. For this reason, it is imperative for higher education institutions, as they represent the final and main stage of professional training for students, to have reliable, timely, and up-to-date SBA studies, through which they can gain a deeper understanding of some of the problems that their student communities face in the academic context, in order to propose diverse alternatives that contribute to preventing, treating, and/or solving the effects of SBA and, consequently, reducing and keeping to a minimum the rates of dropout and temporary or permanent school abandonment.

In the particular case of the Zacatepec Institute of Technology, from the beginning of its activities to date, there is no concrete evidence of the application of SBA studies in students in any of the degree programs it has offered over time. This is why the need arose to carry out this research with the aim of identifying the possible absence or presence of the syndrome and its levels of manifestation in general and according to the degree program and gender of the students, as well as determining whether this syndrome affects the academic performance of students. This study will therefore provide the necessary information to analyze the problem more objectively and in greater depth. It will also reinforce and provide continuity with subsequent research for the development and enrichment of useful information in the appropriate design of psycho-pedagogical strategies that improve the experiential quality of students in more favorable academic contexts, thereby minimizing dropout and school abandonment rates in higher education institutions.

THEORETICAL FRAMEWORK

Academic Burnout Syndrome (ABS) or student burnout, described by Gil-Montes and cited by Caballero et al. [3], as characterized by generating in students feelings of not being able to give more of themselves, both physically and psychologically, a negative attitude of criticism, devaluation, loss of interest in transcendence, loss of value in studying, and growing doubts about their own ability to do so.

For this reason, it is possible to think that ASB may be directly related to failure or dropping out of school, since the greater the exhaustion, cynicism, or lack of effectiveness, the greater the risk of dropping out, according to Álvarez and López [4].

The first studies of SBA were conducted on university students in medicine and nursing, such as that by Balogun in 1995, cited by Barraza [5], and were later applied to students in different fields of study.

SBA emerged between approximately 1987 and 2000 onwards, as a result of one of the variants of Burnout Syndrome (BS), also known simply as "Burnout" or "burnout syndrome," a term and concept established worldwide in 1977 by psychologist Cristina Maslach, one of the leading experts on the subject, who described it as an inadequate way of coping with chronic stress, whose main features are emotional exhaustion, depersonalization, and decreased personal performance, manifested in the professional burnout of people working in various human services sectors, always in direct contact with users, especially healthcare personnel and teachers. Therefore, BS would be the extreme response to chronic stress originating in the work context and would have repercussions of an individual nature, but would also affect organizational and social aspects, according to Martínez [6]. Subsequently, Maslach and Jackson established the conceptualization of the syndrome most accepted by experts in their field, in which they define it as a behavioral manifestation of work stress and understand it as a three-dimensional syndrome characterized by emotional exhaustion (EE), depersonalization (DP) in dealing with clients and users, and difficulty in personal achievement/fulfillment (PF).

In 2000, the World Health Organization (WHO) declared BS a workplace risk factor due to its ability to affect quality of life, mental health, and even put lives at risk. This syndrome is also currently recognized and described in the International Classification of Diseases (ICD-10), which allows for improved identification, prevention, and treatment by health professionals for diagnosis and by psychosocial professionals for prevention, according to data from the Spanish National Institute for Occupational Safety and Health [7].

DEVELOPMENT

To achieve the established objectives, a quantitative descriptive and cross-sectional survey-type study was developed, with non-probabilistic convenience sampling. The survey was conducted at TecNM, Zacatepec campus, Morelos. A total of 100 students were included in the study sample, divided into four groups: two from the IADM program corresponding to the subjects Ethics Workshop (2nd semester)

semester) and Analysis of National Issues (6th semester); and two groups from the IGEM program, with the subjects Fundamentals of Research (1st semester) and Finance in Organizations (5th semester). The sample represented 12% of the total population of both programs and 2% of the general population enrolled in the January-June 2024 semester. The instrument used for data collection was the Maslach Burnout Inventory-Student Survey (MBI-SS) form designed by Schaufeli et al. [8], which is considered the most widely accepted assessment tool for measuring SBA, based on various validation studies that have been conducted on it, such as the one published in 2021 by Banda et al. [9] on university students in El Bajío, Mexico, which obtained favorable results that guaranteed its reliability. The MBI-SS form consists of 15 items designed to assess the dimensions of Emotional Exhaustion with 5 items, Cynicism or Depersonalization with 4 items, and Academic Efficacy with 6 items, as shown in Table 1. It should be noted that if the dimensions "exhaustion and cynicism" reach high values and "academic efficacy" is low, this is indicative of higher SBA. To measure SBA implicit in the instrument, a Likert scale with values from 1 to 5 was used for the response options: 1 = Never, 2 = Almost never, 3 = Sometimes, 4 = Almost always, and 5 = Always.

Table 1. MBI-SS form, with adaptations.

MBI-SS (Maslach Burnout Inventory- Student Survey)		1	2	3	4	5
Tipo y No. de Reactivo	Reactivo	Nunca	Casi Nunca	Algunas veces	Casi Siempre	Siempre
Eficacia_1	Puedo resolver de manera eficaz los problemas relacionados con mis estudios.					
Eficacia_2	Creo que contribuyo efectivamente con las clases en la escuela.					
Eficacia_3	En mi opinión soy un buen estudiante.					
Eficacia_4	Me estimula conseguir objetivos en los estudios.					
Eficacia_5	Durante las clases, tengo la seguridad de que soy eficaz en la finalización de las cosas.					
Eficacia_6	He aprendido muchas cosas interesantes durante mi carrera.					
Agotam_1	Las actividades académicas de esta carrera me tienen emocionalmente "agotado".					
Agotam_2	Estoy cansado en la mañana cuando me levanto y tengo que afrontar otro día en la escuela.					
Agotam_3	Estudiar o ir a clases todo el día me provoca tensión.					
Agotam_4	Me encuentro agotado físicamente al final de un día en la escuela.					
Agotam_5	Estoy exhausto de tanto estudiar.					
Cinismo_1	Me he distanciado de mis estudios porque pienso que no serán realmente útiles.					
Cinismo_2	Dudo de la importancia y valor de mis estudios.					
Cinismo_3	He perdido interés en la carrera desde que empecé la escuela.					
Cinismo_4	He perdido entusiasmo por mi carrera.					

For the final assessment of the results, technical note NTP-732 from the Spanish National Institute for Occupational Safety and Health, written by Bresó et al. [10], which contains the normative data for the interpretation of the MBI-SS, indicating the levels of burnout for each subscale, which were adapted based on the characteristics of the present study, thus defining subscales between 1 and 5 in order to identify the levels of SBA, as shown in Table 2.

Taking advantage of current technologies, the questionnaire was shared with the study sample via Microsoft Teams, and the QuestionPro platform was used for its application and coding. Data processing was performed using Microsoft Excel software, version 10.

Descriptive analyses were performed, such as means, mode, median, standard deviation, etc., and the data behavior was graphed for better interpretation.

Table 2. Burnout levels according to adaptations to technical note NTP-732

EVALUACIÓN DEL SBA					
Opciones de respuesta	Valores	Niveles por Categoría	Rangos	Agotamiento	Cinismo
Nunca	1	Muy bajo	> 5%	< 1.4	< 1.2
Casi Nunca	2	Bajo	5 - 25%	1.5 - 2.2	1.3 - 1.5
Algunas Veces	3	Medio (Bajo)	25 - 50%	2.3 - 3	1.6 - 2.24
		Medio (Alto)	50 - 75%	3.1 - 3.8	2.25 - 3.25
Casi siempre	4	Alto	75 - 95%	3.9 - 4.5	3.26 - 4
Siempre	5	Muy Alto	> 95%	> 4.5	> 4

Reliability test of the instrument with Cronbach's alpha statistic.

To analyze the consistency of the responses obtained in the items and thus ensure the reliability of the form, Cronbach's alpha test was performed, where values from 0 to 0.2 represent "very low" consistency and a value of 1 represents "high" consistency. Thus, for the MBI-SS form, equal values of 0.98 were obtained for all three categories of efficacy, exhaustion, and cynicism, and a total value for the 15 items on the form of 0.99, reflecting "high" consistency, as shown in Table 3.

Table 3. Analysis of the consistency and reliability of the data collection and measurement instrument using Cronbach's alpha test.

Análisis de la consistencia y confiabilidad del MBI-SS				
Categoría:	(1) Eficacia	(2) Agotamiento	(3) Cinismo	Total MBI-SS
No. reactivos:	6	5	4	15
Alfa de Cronbach:	0.98	0.98	0.98	0.99
Análisis de la consistencia:	Alta	Alta	Alta	Alta

Notes: 0 ~ 0.2= Very low consistency; 0.2 ~ 0.4= Low consistency; 0.4 ~ 0.6= Moderate consistency; 0.6 ~ 0.8= Good consistency; 0.8 ~ 1 = High consistency.

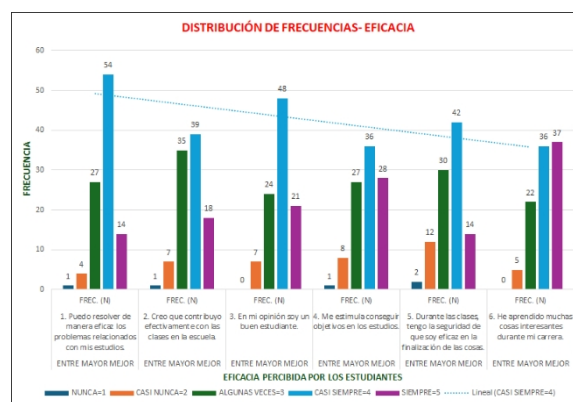
Data analysis strategy.

Univariate techniques were used for metric and non-metric data, resulting in frequency distributions, Pearson's correlation coefficient (r), and Student's t-tests implicit in the hypothesis tests established to confirm or reject the correlation between the variables analyzed. On the other hand, multivariate dependency techniques were also used, through the design of cross-tabulation of one and two independent variables, in order to carry out the analysis of the data when there are two or more measurements of each element or, in this case, SBA category, and the variables are analyzed at the same time. For example, using these techniques, the levels achieved in relation to the gender and career of the students analyzed were identified for each category or element of the SBA.

DISCUSSION AND ANALYSIS OF RESULTS

a) Category: "Academic Effectiveness."

Also described as "self-efficacy," according to Caballero et al. [11], it assesses students' perception of their competence in their studies. Figure 1 shows the results obtained in percentages for the six items established in the efficacy category of the MBI-SS form, where values 3, 4, and 5 prevailed in more than 50% of the sample, with value 4 (almost always) standing out at 42.5%, which corresponds to levels of academic efficacy ranging from "moderate" to "very high," according to the students' perception. This was verified with the average values obtained for the central statistical measures used: Mean (μ)=3.78, Mode (Mo)=4.17, Median (M)= 4.00, and Standard deviation (σ)= 0.89.



Graph 1. Academic effectiveness of students.

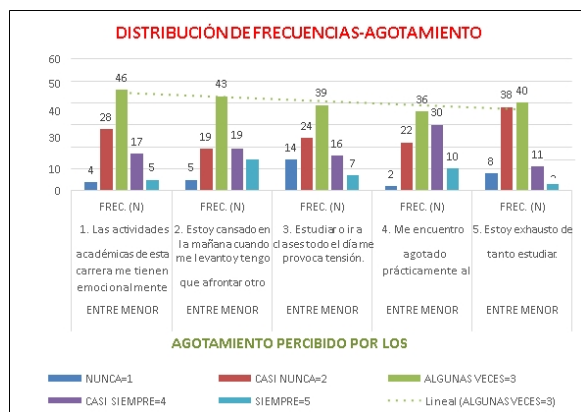
b) Category: "Emotional Exhaustion."

This category assesses the student's experience or feeling of being physically, mentally, and emotionally exhausted, and with a sense of being unable to give more of themselves to academic activities [11]. As shown in Figure 2, the results revealed levels ranging from "moderate" to "very low" emotional exhaustion perceived by more than 50% of students, according to the values 1, 2, and 3 obtained, with value 3 (sometimes) standing out as prevalent in 40.8% of the five items established in total for this category of the MBI-SS form. Results of the central statistical measures that demonstrate this: Mean (μ) = 2.95, Mode (Mo) = 3.00, Median (M)= 3.00 and Standard deviation (σ)= 0.98

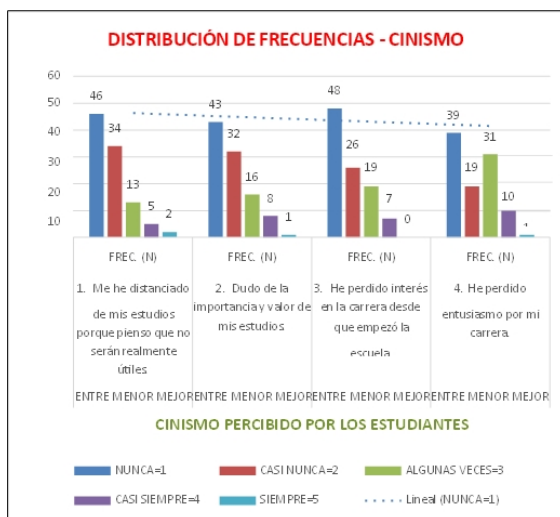
c) Category: "Cynicism or Depersonalization."

This category assessed students' negative attitudes toward their studies, evidenced by self-criticism, devaluation, loss of interest, and loss of significance and value in studying [11]. The results obtained identified levels ranging from "moderate" to "very low" cynicism or depersonalization perceived by more than 50% of the students, according to the values 1, 2, and 3 prevailing in the four items that made up the total.

to this category, highlighting the value 1 (never) with 44%, as shown in Graph 3. This analysis was verified with the resulting central statistical measures: Mean (μ)= 1.94, Mode (Mo)= 1.00, Median (M)= 2.00, and Standard deviation (σ)= 1.01.



Graph 2. Emotional exhaustion among students.



Graph 3. Cynicism or depersonalization in students.

Pearson's asymmetry or correlation tests (r). Also called Pearson's correlation coefficient, it is a measure widely used in various areas of scientific work, from technical, econometric, or engineering studies to research related to the social, behavioral, or health sciences, according to Hernández et al. [12]. To identify and analyze the relationship between the results obtained with the MBI-SS form for the three SBA categories, Pearson's correlation coefficient (r) was used, as well as Student's t-test as a test statistic to ensure the reliability of the results obtained, which are presented below:

- 1) Category: "Academic Effectiveness."

This test identified and compared the relationship and consistency between the perception of being a good student according to the student's own opinion (item no. 5 in the effectiveness category of the form) and their grade point average in the aforementioned subjects for the January-June 2024 semester. To carry out an objective analysis of the results, the performance levels and numerical values established in the format of "Didactic Instrumentation for the Training and Development of Professional Competencies" [13], which is part of the comprehensive training process for students in the Quality Management System (QMS) manual, used to evaluate students enrolled at TecNM, according to the variables established in this analysis: V1= Self-perception of being a good student and V2= Average grade obtained by the student, as shown in Table 5.

Table 5. Relationship between self-perception of being a good student and the average grade obtained in certain subjects in the January-June 2024 semester.

CATEGORÍA: EFICACIA					
Reactivo 3. En mi opinión soy un buen estudiante (V1), en relación con el promedio de calificación obtenido (V2).					
NIVEL DE DESEMPEÑO (N.D.)	OPCIONES DE RESPUESTA	VALORES	FREC. (N) V1	FREC. PROMEDIO V2	VALORACIÓN NUMÉRICA N.D.
Insuficiente	Nunca	1	0	11	≤ 60
Suficiente	Casi nunca	2	7	6	74-70
Bueno	Algunas veces	3	24	21	75-84
Notable	Casi siempre	4	48	45	85-94
Excelente	Siempre	5	21	17	95-100
Totales			100	100	100
COEFICIENTE DE ASIMETRÍA DE PEARSON (CA)		0.51	ESTADÍSTICO DE PRUEBA: t de Student	t= 5.95	VALOR CRÍTICO: α=0.05
MEDIA V1:		3.83	MEDIA V2:	84.58	MODA V1: 4
			MODA V2:	60	MEDIANA V1: 4
					MEDIANA V2: 87

As the value of the asymmetry coefficient or Pearson's correlation (r) of 0.51 was greater than 0, it can be deduced that there is a "positive" correlation between the variables analyzed, as shown in Graph 4, because, while most students considered themselves "almost always" (value 4) as good students, they also obtained averages that placed them at remarkable and excellent performance levels, as shown in Figure 4.

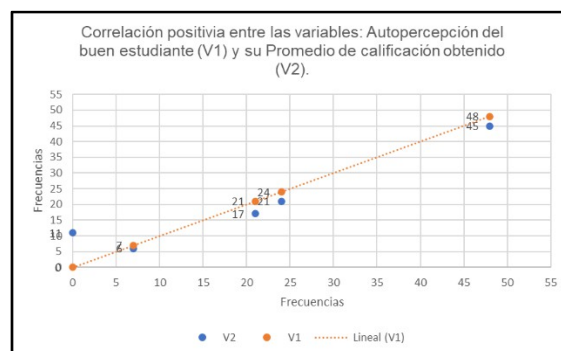


Figure 4. Analysis of positive correlation between variables in the academic effectiveness category.

The correlation is confirmed by the result obtained with Student's t-test statistic of $t = 5.95$, which was greater than the critical value of 1.98 calculated with a significance level of 0.05, thus confirming the rejection of the null hypothesis of no correlation and accepting the alternative hypothesis that there is a correlation between the variables analyzed. Therefore, this test shows that there is sufficient statistical evidence to conclude that r is different from 0.

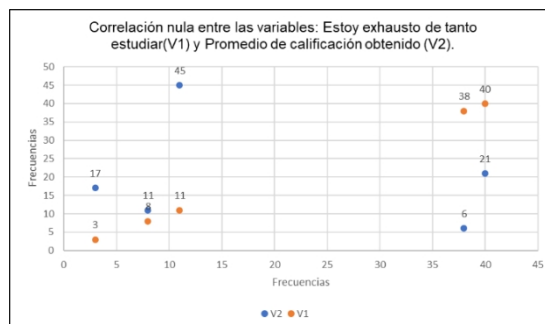
2) Category: "Emotional Exhaustion."

This test sought to identify and compare whether fatigue in studies is an important factor in determining the level of academic performance obtained in the sample of students and study period established. The results showed that there is no correlation of any kind (positive or negative) and therefore no consistency between the variables analyzed: V1 = Being exhausted by studies (item no. 5 in the exhaustion category) and V2= Average grade obtained, as shown in Table 6.

Table 6. Relationship between being exhausted by studies and the average grade obtained in certain subjects in the January-June 2024 semester.

CATEGORÍA: AGOTAMIENTO					
Reactivo 5. Estoy exhausto de tanto estudiar (V1), en relación con el promedio de calificación obtenido (V2).					
NIVEL DE DESEMPEÑO (N.D.)	OPCIONES DE RESPUESTA	VALORES	FREC. (N) V1	FREC. PROMEDIO V2	VALORACIÓN NUMÉRICA N.D.
Insuficiente	Nunca	1	8	11	≤ 60
Suficiente	Casi nunca	2	38	6	74-70
Bueno	Algunas veces	3	40	21	75-84
Notable	Casi siempre	4	11	45	85-94
Excelente	Siempre	5	3	17	95-100
Totales			100	100	100
DE ASIMETRÍA DE PEARSON (CA)	0.07	ESTADÍSTICO DE PRUEBA: t de Student	$t = 0.73$	VALOR CRÍTICO: $\alpha = 0.05$	1.98
MEDIA V1:	MEDIA V2:	MODA V1:	MODA V2:	MEDIANA V1:	MEDIANA V2:
2.63	84.58	3	60	3	87

In this case, the value of " r " was 0.07, therefore, the distribution is symmetrical, which means that there is no correlation between the variables analyzed, that is, fatigue does not affect or alter the level of academic performance obtained and sustained by a passing grade point average, as was the case in the study sample, where the majority obtained a passing average without showing a relevant level of fatigue, as can be seen in Graph 5. With regard to the test statistic, where a value of $t = 0.73$ was obtained, which is lower than the critical value of 1.98 obtained with a 0.05 significance level, the null hypothesis of "no correlation" is confirmed and the alternative hypothesis that there is a correlation between the variables analyzed is rejected. Therefore, this test shows that there is sufficient statistical evidence to conclude that r is not different from 0, or in other words, it is equal to zero.



Graph 5. Analysis of zero correlation between variables in the emotional exhaustion category.

3) Category: "Cynicism or depersonalization."

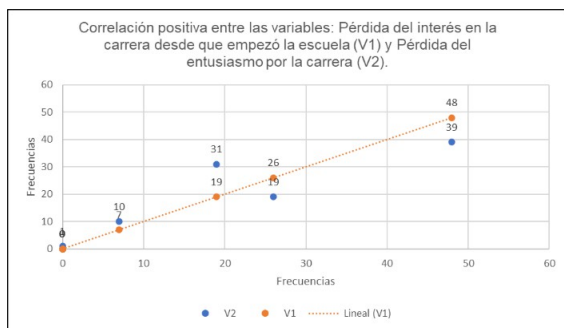
This test sought to identify and compare the extent to which the group of students analyzed affirmed or denied having lost interest in their career since its inception or in the time since then, to such an extent that they had lost enthusiasm for their degree program. These results were used to analyze whether there was a consistent correlation between the variables studied: V1 = Loss of interest in the degree program since starting school and V2 = Loss of enthusiasm for the degree program, as shown in Table 7. Since the value of " t " obtained from 0.75 is greater than 0, it means that the distribution is skewed to the right, indicating that there is a "positive correlation" between the variables analyzed, that is, since students did not lose interest in their degree program since the beginning (V1), they will not lose enthusiasm for their studies in the present or current situation (V2), as stated by 74% and 58% of students respectively for both variables, whose opinions were concentrated between the response options 1=Never and 2=Almost never; this can be seen in Graph 6, whose data sets represented are very similar to each other.

Table 7. Relationship between loss of interest in the career since starting school and loss of enthusiasm for the career.

CATEGORÍA: CINISMO			
Reactivo 3. He perdido interés en la carrera desde que empecé la escuela (V1), en relación con Reactivo 4. He perdido entusiasmo por mi carrera (V2).			
OPCIONES DE RESPUESTA	VALORES	FREC. (N) V1	FREC. (N) V2
Nunca	1	48	39
Casi nunca	2	26	19
Algunas veces	3	19	31
Casi siempre	4	7	10
Siempre	5	0	1
Totales		100	100
COEFICIENTE DE ASIMETRÍA DE PEARSON (CA)=0.75	ESTADÍSTICO DE PRUEBA: t de Student	$t = 11.29$	VALOR CRÍTICO: 1.98 ($\alpha = 0.05$)
MEDIDAS DE TENDENCIA CENTRAL	MEDIA V1: 1.85 V2: 2.15	MODA V1: 1 V2: 1	MEDIANA V1: 2 V2: 2

The result of the t-test statistic = 11.29 was greater than the critical value of 1.98 obtained with a significance level of 0.05. The rejection of the null hypothesis of no correlation is confirmed, and the alternative hypothesis that there is a correlation between the variables analyzed is accepted. Therefore, this test shows that there is sufficient statistical evidence to conclude that " r " is different from 0.

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Graph 6. Analysis of positive correlation between variables in the cynicism or depersonalization category.

Results represented with the cross-tabulation of 1 and 2 independent variables.

Also known as contingency tables, they are a common method of presenting statistical information developed by studies in various sciences, including the social sciences, such as psychology, especially in psychological diagnosis and assessment activities, where specialists are faced with different symptoms that may or may not be associated with a pathology, according to Díaz and Gallego, cited by Cañadas et al. [14], such as the SBA.

Tables 8 and 9 present the results of the three categories of the SBA in relation to the gender and career of the students, of whom 60 were women.

(M) 33 of them enrolled in the IADM program and 27 in the IGEM program, as well as 40 men (H) 27 of them enrolled in IADM and 13 in IGEM, It was determined that 94% of women perceive themselves as having "moderate" to "very high" levels of academic efficacy, compared to 89% of men, with those in the IADM program standing out with 52% (M) and 60% (H), respectively, for the same levels of the aforementioned syndrome. with regard to the second category of emotional exhaustion, 76% of men reported levels ranging from "moderate" to "very low" compared to 72% of women, with those in the IADM program standing out with 41% (M) and 52% (F), the same levels assessed.

Table 8. SBA levels represented by cross-tabulation of one independent variable: gender.

NIVELES DE SBA POR CATEGORÍA																				
NIVELES POR CATEGORÍA	OPCIONES DE RESPUESTA	Categoría:	EFICACIA						AGOTAMIENTO				CINISMO							
		Género:	M			H			M			H			M			H		
		Frecuencias	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Muy bajo	Nunca	1	1	1	0	0	1	1	3	5	3	9	7	7	26	43	18	46	44	44
Bajo	Casi nunca	2	3	5	4	11	7	8	15	25	11	28	26	27	18	29	10	26	28	27
Medio (Bajo)	Algunas veces	3	16	27	11	28	28	28	25	42	16	40	41	41	13	22	68	17	20	19
Medio (Alto)	Casi siempre	4	28	47	15	36	43	41	12	20	7	17	19	18	3	5	48	12	75	8
Alto	Siempre	5	12	20	10	25	22	22	5	8	3	7	8	8	1	2	0	0	1	1
Muy Alto	Siempre	5	12	20	10	25	22	22	5	8	3	7	8	8	1	2	0	0	1	1
Totales			60	100	40	100	100	100	60	100	40	100	100	100	60	100	40	100	100	100

For the category of cynicism or depersonalization, 94% of women reported levels ranging from "moderate" to "very low" compared to 88% of men, with those in the IADM program again prevailing with 53% (M) and 61% (H), respectively.

Table 9. SBA levels represented with the cross-tabulation of two independent variables: gender and degree program.

NIVELES DE SBA POR CATEGORÍA																										
NIVELES DE EFICACIA	OPCIONES DE RESPUESTA	Categoría:	EFICACIA						AGOTAMIENTO				CINISMO													
		Género:	MUJERES			HOMBRES			MUJERES		HOMBRES		MUJERES		HOMBRES											
		Canera:	IADM	IGEM	IADM	IGEM	IADM	IGEM	IADM	IGEM	IADM	IGEM	IADM	IGEM	IADM	IGEM										
		Frecuencias	No.	No.	%	No.	No.	%	No.	No.	%	No.	No.	%	No.	No.	%									
Muy bajo	Nunca	1	1	1	0	1	0	0	0	2	4	1	2	6	1	3	25	11	18	13	31	6	1			
Bajo	Casi nunca	2	1	2	2	3	3	8	1	3	9	16	6	9	8	24	3	7	10	16	8	13	8	19	3	
Medio (Bajo)	Algunas veces	3	7	12	9	15	8	20	3	8	13	21	12	20	10	26	5	14	7	11	6	10	4	10	3	
Medio (Alto)	Casi siempre	4	15	24	13	22	10	26	4	10	6	10	6	10	5	12	2	6	1	2	2	3	3	7	2	
Muy Alto	Siempre	5	9	16	3	5	6	14	4	10	5	2	4	1	4	1	0	0	1	1	0	1	0	0	0	
		Totales	33	55	27	45	27	45	13	32	33	56	27	45	13	32	33	56	27	45	13	32	33	56	27	45

Overall results of the SBA scales according to the normative data in technical note NTP-732.

Table 4 shows the overall results obtained, which were evaluated using the normative data established in technical note NTP-732 adapted to this study (Table 2), with the aim of identifying SBA levels in its three categories: academic efficacy, emotional exhaustion, and cynicism or depersonalization. The results obtained indicated that 74% and 92% of the students included in the study sample presented levels ranging from "moderate" to "very low" emotional exhaustion and cynicism, respectively, while 92% reported levels of academic efficacy ranging from "moderate" to "very high," which together represent a positive indicator contributing to a favorable overall assessment of SBA, as described below:

Table 4. Descriptive statistics of the subscales established in technical note NTP-732 with adaptations.

NIVELES GENERALES DEL SBA					
Categorías			Agotamiento	Cinismo	Eficacia
Opciones de respuesta	Valores de respuesta	Niveles de la categoría			
		Rangos de puntaje	Criterio: entre menor mejor.	Criterio: entre menor mejor.	Criterio: entre mayor mejor.
			%	%	%
Nunca	1	Muy bajo	6.6	44	0.83
Casi nunca	2	Bajo	26.2	27.75	7.17
Algunas veces	3	Medio (Bajo)	25 - 50%	40.8	19.75
		Medio (Alto)	50 - 75%		27.5
Casi siempre	4	Alto	75 - 95%	18.6	7.5
Siempre	5	Muy Alto	> 95%	7.8	1
No. de reactivos			5	4	6
Total por categoría			74	92	92
Estudiantes con niveles moderados, muy bajos y nulos del SBA				86	
Estudiantes con niveles altos y muy altos de SBA				14	
Media			2.95	1.94	3.78
Moda			3.00	1.00	4.17
Mediana			3.00	2.00	4.00
Desviación estándar			0.99	1.01	0.89

On the one hand, the presence of SBA is confirmed in 14% of the study sample, who experienced high and very high levels of the syndrome in question; on the other hand, moderate to very low levels of SBA were identified in 86% of the students. With

With regard to gender, on the one hand, the syndrome was identified mainly in men, with 16% at high and very high levels, compared to 13% of women at the same levels; on the other hand, moderate to very low levels were identified in 87% and 84% of women and men, respectively. Based on the students' majors, on the one hand, the syndrome manifested itself to a greater extent and in a general way with 16% in the IADM major with high and very high levels, distributed among 6% of women and 10% of men, compared to the IGEM major with 9% in general, distributed among 3% and 6% for men and women, respectively, and at the same levels. On the other hand, moderate to very low levels were identified in 58% of men and 49% of women in IADM, and for the IGEM degree program, 38% of women and 27% of men, for the same levels.

Finally, with regard to whether the SBA detected at high and very high levels in 14% of the sample affected the academic performance of the students, the results showed that this was indeed the case, specifically in 11% of these students, who obtained failing grades; The opposite was true for the rest of the students, as 83% of them obtained grade point averages ranging from 80% to 100%, thereby achieving "good" (21%), "notable" (45%), and "excellent" (17%) at the end of the January-June 2024 semester, as shown in Table 5, which once again reaffirms the absence of SBA at alarming levels in more than 80% of the students who made up the study sample.

CONCLUSIONS

Based on the information presented in the previous section, it was concluded that worrying levels of SBA were not significantly present in the students who formed part of the study sample, and among those who did exhibit it, those in the IADM program were the most affected. In terms of gender, men were found to be the most affected, having presented high levels of emotional exhaustion and low academic efficacy compared to women. However, these results only applied to a specific period of time and only to two programs of study. Therefore, over the years, these results could change dramatically. For this reason, it is suggested that this type of research be continued to allow for constant monitoring of the syndrome in all programs at the educational technology institute, preferably, and thereby establish the most relevant preventive or corrective measures, such as those suggested in Guerrero and Rubio [15], whose results would also have to be tested again with the SBA studies conducted.

The following are proposed for future lines of research: (1) carry out SB studies applied to students and teachers at the educational institution,

Taking into account geographical, economic, and sociocultural criteria and variables to identify their relationship and influence on the possible effects that the syndrome could have on them if it manifests itself, in order to regulate and control its triggering factors more effectively, thus achieving a balance in both contexts, i.e., students and teachers, and ensuring that the teaching-learning process is truly meaningful.

(2) Conduct documentary research on SB focused on both students and teachers, with the aim of identifying and establishing appropriate preventive and corrective measures or actions that progressively mitigate the effects of SB detected.

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Table of contribution roles

Role	Author(s)
Conceptualization. Data curation. Methodology. Project management. Resources. Software. Supervision. Visualization. Writing, review, and editing.	Nayely Mariela Tafolla Sánchez



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