

<https://doi.org/10.23913/ride.v14i27.1546>

*Artículos científicos*

## **Propuesta de plantilla automatizada en Excel para evaluar autoestima, auto concepto y motivación**

***Proposal of an automated Excel template to assess self-esteem, self-concept, and motivation***

***Proposta de modelo automatizado em Excel para avaliar autoestima, autoconceito e motivação***

**Yolanda Flores Ramírez**

Instituto Tecnológico Superior de Nuevo Casas Grandes, México

[yflores@itsnecg.edu.mx](mailto:yflores@itsnecg.edu.mx)

<https://orcid.org/0000-0001-9012-9550>

Agradecimiento por su invaluable apoyo a: José Ángel Pendones Fernández, Germán Espino Olivas, Francisco Acosta Carrasco, Roberto Escárcega Elizondo, Félix A. Durán Núñez y Miriam L. Villaseñor Durán

### **Resumen**

La reprobación y deserción en instituciones educativas de nivel superior se han convertido en problemas comunes, especialmente en los semestres iniciales, lo que afecta la eficiencia terminal. El objetivo de este estudio fue crear una plantilla única y automatizada en Excel con macros para evaluar los factores psicológicos y generar estrategias de intervención que ayuden a reducir estos índices. Se diseñó la plantilla con ítems de las escalas del Instrumento González Arratia (IGA 2001), la Escala de motivación académica (EMA) y la Tennessee Self Concept Scale. La metodología aplicada fue de enfoque cuantitativo, con un alcance descriptivo, experimental y de análisis. Las variables de estudio fueron la plantilla automatizada, la reprobación y la deserción.

El diseño de la plantilla se realizó siguiendo la programación básica de Excel con macros. Mediante el pilotaje se determinó que el coeficiente alfa de Cronbach tenía una confiabilidad

de 0.79. La plantilla se aplicó a una muestra de 31 alumnos del primer semestre de la carrera de Contador Público en el Instituto Tecnológico Superior de Nuevo Casas Grandes, nueve hombres y 22 mujeres, con edades comprendidas entre 17 y 18 años.

Los resultados de este estudio incluyen un instrumento automatizado para la evaluación individual, un informe sobre los puntajes obtenidos por los alumnos en cada uno de los factores y el diseño e implementación de una estrategia de intervención. Se concluye que el instrumento automatizado y la evaluación oportuna son clave para detectar situaciones de riesgo e intervenir con estrategias focalizadas y específicas, con el objetivo de promover la permanencia y retención de los alumnos.

**Palabras clave:** automatización, deserción, factores psicológicos, plantilla, reprobación.

### Abstract

Failure and desertion in higher education institutions has become a widespread problem, especially in the initial semesters, affecting terminal efficiency. The objective of this study was to create a unique template, automated in Excel with macros for the assessment of psychological factors and, with the results, generate intervention strategies to help reduce these rates. The template was designed with items from the scales of the González Arratia Instrument (IGA 2001), Academic Motivation Scale (EMA) and Tennessee Self Concept Scale. The methodology was of an applied nature, with a quantitative approach, descriptive, experimental, and analytical scope. The variables were: automated template, failure, and dropout. The methodology was: the design of the template according to the basic Excel programming with macros, through piloting the Cronbach's alpha coefficient determined with a reliability of 0.79, the template was applied to a sample of 31 students of the first semester of the Public Accountant Program of the Instituto Tecnológico Superior de Nuevo Casas Grandes; nine men and 22 women with an age range of 17 to 18 years old. The results of this study were: automated instrument for individual assessment, report of the scores obtained by the students in each of the factors and the design and implementation of an intervention strategy. It is concluded that the automated instrument and the timely assessment are key to detect risk situations and to intervene with targeted and specific strategies to promote the permanence and retention of students.

**Keywords:** automation, dropout, psychological factors, staffing, failure.

## Resumo

A reprovação e a deserção nas instituições de ensino superior têm se tornado problemas comuns, principalmente nos semestres iniciais, o que afeta a eficiência terminal. O objetivo deste estudo foi criar um modelo único e automatizado em Excel com macros para avaliar fatores psicológicos e gerar estratégias de intervenção que ajudem a reduzir esses índices. O modelo foi elaborado com itens das escalas González Arratia Instrument (IGA 2001), Academic Motivation Scale (EMA) e Tennessee Self Concept Scale. A metodologia aplicada foi de abordagem quantitativa, com âmbito descritivo, experimental e analítico. As variáveis do estudo foram o gabarito automatizado, reprovação e deserção.

O desenho do template foi feito seguindo a programação básica do Excel com macros. Por meio de testes, foi determinado que o coeficiente alfa de Cronbach tinha uma confiabilidade de 0,79. O modelo foi aplicado a uma amostra de 31 alunos do primeiro semestre da carreira de Contador Público do Instituto Tecnológico Superior de Nuevo Casas Grandes, dos quais 9 eram homens e 22 mulheres, com idades compreendidas entre os 17 e os 18 anos.

Os resultados deste estudo incluem um instrumento automatizado de avaliação individual, um relatório sobre as pontuações obtidas pelos alunos em cada um dos fatores e o desenho e implementação de uma estratégia de intervenção. Conclui-se que o instrumento automatizado e a avaliação oportuna são fundamentais para detectar situações de risco e intervir com estratégias focadas e específicas, com o objetivo de promover a permanência e retenção dos alunos.

**Palavras-chave:** automação, deserção, fatores psicológicos, pessoal, fracasso.

**Fecha Recepción:** Enero 2023

**Fecha Aceptación:** Junio 2023

---

## Introduction

Higher education in Mexico faces a significant problem related to failure and dropout, also known as school dropout (Mares et al., 2012). This problem has a negative impact on the terminal efficiency indicator, since the data shows that of every hundred students who entered in the 2014-2015 period, only twenty-eight managed to graduate in the 2020-2021 period (Secretary of Public Education, SEP, 2021, p.37).

When a student fails to obtain the necessary credits to qualify their academic performance as satisfactory, they are considered to have failed and must repeat the subject or take a new exam. This can affect her self-esteem and is associated with school dropout (Torres-Zapata

et al., 2020). Poor academic performance can generate interconnected problems, as Reyes et al. (2017), since if a student fails several subjects, it is likely that she will eventually drop out of the educational system. Dropout refers to the temporary or permanent abandonment of school (Amador et al., 2021, p. 140).

Numerous investigations have been carried out on the causes or factors that contribute to failure and desertion, and the socioeconomic factor is usually considered as a risk, while the psychological or socio-emotional part is analyzed less frequently. For this reason and based on previous studies, in this project self-esteem, self-concept and motivation were chosen as study variables. Olmos (2020) presents a classification of the factors that influence school dropout, ranging from social, economic, organizational and interactional aspects, to psychological aspects. In this sense, he affirms that "it is possible to distinguish the students who remain and the dropouts through the attributes of their personality" (p. 15). The self-concept refers to the "concept that the individual has of himself as a physical, social and spiritual being" (García and Musitu, 2014, p. 10). Himmel (2002) describes Eccles' premise, which holds that "prior academic performance influences future performance by affecting students' self-concept, their perception of difficulties, their goals, values, and expectations of success" (p. 98 ). Alvarado (2010) conducted a study using the modified Tennessee scale to determine the factors that influence the academic performance of nursing students at the Universidad Nacional Mayor de San Marcos. The results show that self-concept influences academic performance by 91.5%.

Self-esteem is defined as the combination of confidence and self-respect. Having high self-esteem implies feeling capable and valuable (Branden, s/f). According to Cortés (2017), it is normal for a student to have low levels of this factor for short periods, but when it becomes recurring or permanent, it can negatively affect her academic performance. Motivation refers to what drives or has the ability to drive; it is the engine of human behavior (Carrillo et al., 2009, p. 21). Globally, only one in three postgraduate students manages to obtain their academic degree, with the lack of intrinsic and extrinsic motivation being one of the elements that contributes to this problem. (Lora, 2020).

## Research Problem

The Higher Technological Institute of Nuevo Casas Grandes (ITSNCG), affiliated with the National Technological Institute of Mexico, is located in the Northwest of the State of Chihuahua, Mexico. It offers seven educational programs and faces high failure and dropout rates, especially in the first semesters. There are general "remedial strategies" that are adopted as guidelines, which consist of reviewing the failure rates in each subject and by each teacher. If a teacher has a failure rate greater than 50% in a specific subject, they are required to complete a form to explain the reasons for that rate. In the case of desertion, the corresponding academic unit is informed about the students who abandon their studies, and this information is documented and archived.

Currently, the institutional tutoring program provides follow-up to students with poor performance and attempts are made to prevent desertion through the support of tutors. Although there is no study that shows that this tutorial program has contributed to the decrease in these rates, it has aroused the interest of tutor teachers to analyze this problem and start research to understand the causes of this phenomenon. It is evident that this problem is multifactorial and can vary according to the educational program, the origin of the student (rural or urban), the secondary education they completed, the economic situation, previous knowledge or interest in the chosen area of study, if they work, if you are a father or mother, if you have the support of your parents, among others. It is important to mention the study by Callejas et al. (2019), who analyze the causes of this problem through a multifactorial approach, pointing out that it is necessary to address it in a general way and then delimit each factor in terms of space and time.

A study published in 2021 in the Revista Iberoamericana para la Investigación y el Desarrollo Educativo (RIDE) entitled "Self-concept, self-esteem, motivation and their influence on academic performance: case of students of the career of Certified Public Accountant". In this research, three scales previously validated in Mexico were applied to analyze the significance of each factor and its dimension in academic performance using the Student's t-test. In this way, the specific dimensions of each psychological factor that affect the failure and desertion of the students of the Public Accountant career were determined. The objective was achieved, but another problem was identified: the manual process of obtaining the results of the individual assessments in Excel is very slow. By the time the scores are obtained, the semester is almost over and there is not enough time to implement

actions. Therefore, the question arose: What effect would have an automated instrument that helps to timely evaluate the psychological factors in the indicators of failure and desertion within the institution?

With the objective of promoting academic retention, this research proposes to develop an automated template in Excel with macros that contains the questions of the Scale Self Concept Tennessee, the Academic Motivation Scale and the IGA-2001 instrument, used to assess the psychological factors of self-concept, motivation and self-esteem, respectively. The proposal consists of adjusting and redesigning the scales to create a single automated template that contains the questions that measure the factors previously identified as having an impact on academic performance. In this way, the scores resulting from the application of the survey can be obtained in a timely manner and, in the event of detecting deficient levels, the students corresponding to the corresponding area can be referred to provide them with support, strategies and dynamics that strengthen the factors that represent risk. reprobation or desertion.

## Materials and methods

This research had an applied approach, seeking solutions to an existing problem using existing theories. A mixed approach was used, since both qualitative and quantitative data were analysed. The scope of the research was descriptive, experimental and analysis, since the variables were described as they are presented in reality and an experiment was carried out with the implementation of an intervention strategy to analyze and compare its effect on the indices of rejection and desertion.

It is important to note that there are many instruments available to measure the psychological factors analyzed in this study. However, the Scale Self Concept Tennessee scale, the Academic Motivation Scale and the IGA-2001 instrument were selected for two reasons: firstly, because these instruments have already been validated in Mexico and measure multiple dimensions in each of the factors of interest; secondly, because previously an analysis and measurement was carried out to determine which factors and dimensions have an impact on academic performance specifically in ITSNCG students. In this way, the three scales were unified and the number of items was reduced, since there are a total of 125, which would make the survey too extensive.

To develop the automated template, named "Unified Template for Measuring Self-Esteem, Self-Concept and Motivation Factors" of the EMA scale, only 24 questions with response options ranging from "not at all" to "totally" were selected. These questions measure internalized extrinsic motivation, pure intrinsic motivation, vocational intrinsic motivation, and amotivation.

The level of internalized extrinsic appears when the behaviors undertaken are done to achieve some different end and objective, and not for the behaviors themselves. Intrinsic motivation refers to doing an activity for its own sake and the pleasure and satisfaction derived from participation arises from innate psychological needs for competence and self-determination. Amotivation is an active state of lack of motivation, when people perceive a lack of contingency between their actions and the results they obtain (Manassero and Vázquez, 1997, para. 8).

From the González-Arratia IGA 2001 self-esteem scale, a total of 20 questions were taken out of the 25 available. Response options include "always", "sometimes" and "never", and measure the factors of self, failure, intellectual work, emotional and success.

The "I" factor refers to the individual sense of self. "Failure" refers to the perception of unsuccessful experiences. "Intellectual work" is evaluated in the school context in which the subject performs. The "emotional" factor is related to the affective part and the perception of concern on the part of significant people. "Success" refers to the fulfillment of objectives and the achievement of goals accompanied by a feeling of well-being (Camacho et al., 2011).

From the Fits 1972 scale, 18 questions with six response options ranging from "completely false" to "completely true" were selected. These items measure the factors of physical self-concept, moral-ethical self-esteem, personal self-esteem and social self-esteem.

The physical self-concept refers to the point of view that the subject has about his body, health, physical appearance, strength capacities and sexuality. Moral-ethical self-esteem evaluates your moral strength, convictions about good and bad, relationship with God and religious life. The personal self-esteem factor reflects the internal values of the subject, his personal adequacy and the assessment of his personality beyond physical and relational issues. Finally, social self-esteem represents the attitude of the subject towards himself based on his relationship with others (Iñiguez Fuentes, 2016, p. 68). See table 1.

**Table 1.** Origin of the items

Factor	Items	Response options	Number of Items	Scale of origin
Motivation				
Internalized extrinsic motivation, pure intrinsic motivation, intrinsic vocational motivation and demotivation	1 to 24	7	24	EMA
Self-esteem				
Self, failure, intellectual and emotional work, and success.	25 to 44	3	20	IGA-2001
Self-concept				
Physical, moral-ethical, personal and social	45 to 62	6	18	Tennessee Self Concept Scale

Source: EMA scale by Manassero and Vázquez (1997), IGA scale by González Arratia, Camacho et al., (2011) and Tennessee Self Concept scale by Fits 1972, Iñiguez Fuentes (2016).

The unified template was developed using the 62 multiple-choice questions with a Likert-type scale. The items were transferred to an Excel spreadsheet and macros were enabled. The necessary functions and formulas were programmed to obtain the individual scores and the interpretation of the level of each one of the factors automatically. The indications of each of the scales were respected, since some questions were added to obtain the high, medium or low result. See table 2.



**Table 2.** Number of questions measured by each factor

Factor	Questions	Intervals
Motivation		
Internalized extrinsic motivation	24, 6, 23, 18,11,5, 17, 14, 2, 8	high 70- low 10
Pure intrinsic motivation	15, 9	high 14 -low 2
Demotivation:	16, 22, 10, 4, 12, 19, 20	muy desmotivado = 49 nada= 7
Intrinsic vocational motivation	7, 13, 21, 1, 3	high 35- low 7
Self-esteem		
Self	25, 30, 35, 40, 43	5 high -15 low
Failure	26, 31, 36, 41, 44	5 high - 15 low
Intellectual work	27, 32, 37, 42	4 high -12 low
Emotional	29, 34, 39	3 low - 9 high
Success	28, 33, 38	2 high- 9 low
Self-concept		
Physical	45, 46, 47, 48, 49, 50	18 very well- 6 very bad
Moral ethics	51, 52, 53, 57, 58, 59	18 very well- 6 very bad
Personal	54, 55,56, 60,61,62	18 very well- 6 very bad

Source: Own elaboration

The target population was defined as the students enrolled in the first semester of August-December 2022 of the Public Accountant degree because the main problem of failure and desertion occurs in the first semesters. In total there are 55. This information was obtained from the institutional database. The sample was determined with the finite formula and a confidence level of 0.95. A total of 31 students were obtained to survey. The sampling was random probabilistic, all the students that make up the population had the same probability of being surveyed.

For the reliability test, a pilot was carried out where the instrument was applied to 10 students. With the information collected, Cronbach's alpha coefficient was determined to verify the reliability of the instrument. A 0.79 was obtained, proving that the data collection instrument or unified template is reliable. The respondents were accompanied at all times to confirm that the instructions were understandable, as well as the vocabulary used.

To generate the report of the scores obtained, the survey was applied to the total sample using the automated template. The report of the students with deficient psychological factors was sent to the psychology and tutoring department so that strategies could be designed and carried out to strengthen the detected weaknesses. Finally, the dropout and failure rates of the August-December 2021 semester were compared against December-August 2022 to

measure the effect on the indicators studied when using the automated template and obtaining the evaluation in a timely manner.

The following research hypothesis was formulated:

H1. An automated template generates timely information on the psychological level of first semester students to develop intervention strategies and reduce failure and desertion by 2%.

## Results

For the preparation of the automated template, as a first step Excel was used with macros to program the functions and formulas, and in this way obtain the assessment of each psychological factor to be measured with the corresponding dimension. Three spreadsheets were designed: the first one is called "Survey", it contains all the questions with the answer options. The fields to fill out are the student's control number, the name with the last name and the grade for the first and second semester (in case students from other semesters are surveyed). It is programmed so that, in the event that any question is missing to be answered by mistake, a message is activated and it does not allow progress until all the items are answered. See figure 1.

Figure 1. Survey

Source: Own elaboration

The second page is called "Results", there you can check the score obtained, the interpretation (low, medium, high), the factor and its dimensions. This sheet, when surveying the student, allows you to deactivate the macros so that he cannot see his results, since he could change his answers. See figure 2.



Figure 2. Results

Regresar a captura
ENCUESTA ALUMNOS

Nombre:		No. Control a analizar:	<input style="width: 100%;" type="text"/>
A. Paterno:		<span style="background-color: #4b0082; color: white; padding: 2px 10px; border-radius: 5px;">Buscar</span>	
A. Materno:			
Cal. Preparatoria:			
Cal. Semestre:			

Factor	Puntuación	Interpretación	Factor	Puntuación	Interpretación
Motivación extrínseca internalizada (MEI)	42	MEDIO	Yo	10	MEDIO
Motivación intrínseca pura (MIP)	4	BAJO	Fracaso	10	MEDIO
<b>Desmotivación (D)</b>	<b>19</b>	<b>MEDIO DESMOTIVADO</b>	Trabajo intelectual	6	MEDIO
Motivación intrínseca vocacional (MI-V)	16	MEDIO	Éxito	6	MEDIO
			Afectivo - emocional	6	MEDIO

  

Factor	Puntuación	Interpretación	Puntuación	Interpretación
Autoconcepto factor físico	3	2	5	21
Autoestima factor moral	4	4	3	20
Autoestima factor personal	3	3	3	19

Source : Own elaboration

Sheet number three is called "Database". All the answers and data of the respondents are stored in this sheet. If subsequent consultations are required, only the control number is placed on the sheet called "Results" and the scores and interpretation are shown. See figure 3.

Figure 3. Database.

Alumno					Escala GMA										Autoestima																																									
Vo. Control:	Nombre:	A. Paterno:	A. Materno:	Cal. Preparatoria:	Cal. Último semestre:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46					
						10	9.97	5	4	3	1	4	5	2	3	2	4	6	3	4	2	1	3	4	4	3	1	6	5	2	1	1	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	3	3	2						
						8	9.97	9	4	1	2	5	4	1	1	2	4	7	3	5	4	1	1	7	3	5	3	1	6	7	2	2	2	3	3	1	2	1	2	3	2	2	2	2	2	2	2	2	2	4	3					
						9.4	9.8	7	7	1	7	7	3	4	7	7	7	3	1	7	7	1	1	7	7	2	3	1	3	3	1	2	1	1	2	2	2	1	1	2	2	1	2	2	2	1	2	2	1	2	4	5				
						9.8	10	6	6	5	1	7	6	6	7	2	1	7	5	6	2	2	1	3	5	7	4	5	1	6	7	1	3	2	2	3	1	2	2	1	3	2	2	1	3	2	2	2	1	3	3	4				
						8.3	9.87	6	6	4	1	7	7	6	6	4	2	7	6	5	4	1	2	5	6	6	5	2	6	7	1	3	1	2	1	3	2	2	3	2	2	2	2	2	2	2	3	1	3	1	2	3	4			
						7.9	9.9	7	5	6	1	7	7	6	7	2	1	6	6	7	6	4	1	6	6	6	5	1	7	7	2	2	1	2	3	2	2	3	1	1	2	2	1	2	2	1	2	1	2	1	2	3	3	2		
						8.6	9.9	7	6	1	6	7	6	5	3	7	6	6	5	1	2	4	4	4	3	5	5	1	3	2	3	3	1	3	2	1	3	1	2	1	1	3	1	1	3	1	1	3	5	5						
						8.5	9.9	5	6	4	1	4	7	3	6	2	1	6	7	4	5	2	1	2	5	4	5	2	1	6	7	2	3	2	1	3	3	1	2	3	2	2	2	2	2	3	2	3	2	3	4	5				
						8.5	9.9	4	7	1	7	7	3	7	2	2	7	4	6	2	1	2	6	7	4	2	4	2	4	7	2	2	2	3	2	2	2	2	2	2	2	2	2	2	1	2	3	1	3	2	2	3	4			
						9.0	9.9	4	5	6	2	6	6	5	1	5	4	6	5	6	5	4	5	4	6	4	2	5	6	2	1	2	2	1	2	2	1	2	2	1	2	2	3	2	1	2	2	2	1	2	1	3	3			
						8	9.9	7	7	4	1	7	7	1	6	3	1	6	6	6	6	6	6	6	6	5	1	1	3	7	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1				
						8	9.9	7	3	5	1	4	5	7	5	1	4	1	7	5	1	1	4	5	4	4	2	1	3	5	1	2	2	2	2	1	2	1	2	1	2	1	2	1	2	2	2	1	1	2	3	4				
						9.2	9.9	7	6	1	7	4	6	7	4	1	6	7	5	1	4	6	6	5	6	1	7	7	1	3	2	3	3	2	3	1	1	2	1	2	1	2	1	2	2	3	1	1	3	5	5					
						9	9.9	4	5	4	2	5	6	4	5	4	6	4	4	4	2	4	4	2	4	5	3	4	4	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	3			
						8.7	9.9	7	7	6	1	7	7	3	1	7	7	7	4	1	6	7	7	5	1	7	7	1	3	1	3	3	1	3	1	1	3	1	1	3	1	1	2	1	3	1	1	1	1	3	4	3				
						8.8	9.9	7	6	1	7	5	6	7	4	1	7	7	3	1	4	4	7	5	1	5	7	1	3	1	2	3	1	2	2	1	3	1	2	1	1	3	1	1	1	3	1	1	1	1	2	3	4			
						8.5	9.9	6	6	4	2	7	6	7	6	6	2	6	7	6	1	4	7	6	5	1	6	7	2	3	2	1	2	2	3	2	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	4	4		
						9.9	9.9	7	1	6	1	7	7	6	7	5	1	5	6	5	6	3	1	4	7	6	7	4	1	7	7	2	3	1	3	2	3	1	1	3	2	2	1	1	3	2	3	1	2	3	1	2	3	4		
						9.9	9.9	5	6	5	1	4	4	5	6	4	4	5	4	1	4	4	5	4	1	4	4	5	1	4	5	3	1	2	2	1	3	1	3	2	1	3	1	2	2	2	3	1	3	1	3	1	3	1		
						9.9	9.9	7	7	6	1	7	7	6	6	5	1	5	6	6	5	1	5	6	6	5	1	6	6	2	3	1	3	3	2	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	4	3		
						10	9.9	6	6	4	2	7	4	6	3	2	2	6	4	6	4	6	4	2	6	7	2	2	1	2	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	
						10	9.9	7	7	3	1	7	7	5	7	1	1	6	7	6	5	1	1	3	6	7	6	2	1	6	7	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4
						10	9.9	7	7	3	1	7	7	5	7	1	1	6	7	6	5	1	1	3	6	7	6	2	1	6	7	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4

Source: Own elaboration

Once the unified template to measure psychological factors was prepared, the surveys were applied. To comply with research ethics, the students were explained how to answer the surveys and what the study consists of. They were asked for their authorization to deliver the report of their results to the tutoring and psychology area, as well as to use their information



in this study. To do this, they signed a document and a list with consent signatures was obtained.

With the information collected, a report was prepared for the tutoring and psychology area with the individual assessment of each of the students, the scores obtained and the interpretation of the level of each factor. This will allow these departments to analyze, develop and implement strategies to strengthen those psychological factors for healthy human development that provide them with tools to face complicated situations during their professional training. See figure 4.

**Figure 4.** Individual assessment report on psychological factors, self-esteem, motivation, self-concept.

no	autoestima					motivación		AUTOCONCEPTO					autoestima					autoconducta					
	familia	fracaso	trabajo intelectual	éxito	afectivo-emocional	estrés	desmotivación	FÍSICO	MORAL ÉTICO	PERSONAL	FAMILIAR	social	físico	moral ético	personal	familiar	social	físico	moral ético	personal	familiar	social	
baja			baja	baja		baja		baja				bajo					bajo						bajo
baja			baja			baja		baja	bajo			bajo	bajo				bajo	bajo					bajo
baja	baja	baja		BAJA		baja	baja				bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja						bajo	bajo	bajo	bajo	bajo							bajo
baja			baja	baja		baja		baja	baja			bajo	bajo	bajo	bajo	bajo							bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	baja	baja		baja	baja	baja	baja	baja	baja	baja	baja	baja	baja	baja	baja
baja			baja	baja		baja						baja	baja	baja	baja	baja	baja	baja	baja	baja	baja	baja	baja
baja			baja	baja		baja		baja				bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja		baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja				bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja				bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja	baja	baja	baja	baja	baja	baja	baja	baja	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo
baja			baja	baja		baja		baja	bajo			bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo	bajo

Source: Own elaboration.

The information from the results is summarized in this table to identify the characteristics of the group surveyed. See table 3.



**Table 3.** Summary results of the unified template applied to 31 students

Motivation	High	Medium	Low	Total
Internalized extrinsic motivation	23	8	0	31
Pure intrinsic motivation	5	9	17	31
Demotivation	31			
Intrinsic vocational motivation	16	15		31
Self-esteem	High	Medium	Low	Total
Self	10	20	1	31
Failure	17	12	2	31
Intellectual work	8	22	1	31
Success	5	26	0	31
Emotional affectivde	12	19	0	31
Self-concept	Very well	Medium	Very bad	Total
Physical	4	23	4	31
Moral-ethical	2	13	16	31
Personal	1	15	15	31

Source: Own elaboration

In demotivation, the high result at 100% is very worrying, since in its entirety, regardless of age, gender or level of academic performance, all the students surveyed are demotivated.

With this information, the tutoring department designed and delivered an intervention workshop that consisted of considering the psychological factors of self-esteem, self-concept, and motivation as a starting point. The purpose of the workshop was to psychoeducate students about the difference between intrinsic and extrinsic motivation, how to recognize, develop and consolidate them. For self-concept, it began by explaining the difference between self-concept and self-esteem. Self-concept refers to the labels we use to define ourselves. An activity called "How am I?" and "How do they see me?" As for self-esteem, it refers to the extent to which we like and accept ourselves. Functional strategies were shared to identify self-esteem in its different dimensions and the development and consolidation of the six pillars of self-esteem were addressed: personal integrity, living with purpose, living consciously, responsibility towards oneself, self-affirmation and acceptance.

To determine Table 4, only the students of school groups A and B of the first semester of the Public Accountant career were taken, that is, the target population. To calculate the indexes of the mentioned semesters, the indications of the institution's manual were followed. "The dropout rate aims to evaluate institutional performance by accurately determining the permanence of students within the Technological". The formula used is:  $\text{dropout} = (\text{students permanently withdrawn} / \text{total students enrolled in the period}) * 100$ . "The failure rate is

intended to measure the degree of efficiency of the educational process." The formula used is:  $\text{failure} = (\text{failure rate per institution of all subjects, of all semesters and majors} / \text{total number of subjects}) * 100$ .

The indices were obtained from the institutional database of the total number of students enrolled in the years 2021 and 2022. A comparison of the semesters August-December 2021 with August-December 2022 was made. Table 1 shows a decrease in both indicators. Failure decreased by 3.26% and desertion by 6%. See Table 4.

**Table 4.** Comparison of failure and dropout rates

	August december 2021	August december 2022	Difference
Reprobation	13%	9.74%	3.26
Dropout	15.09%	9.09%	6

Source: Own elaboration

## Discussion

Failure and desertion are latent problems not only in Mexico, but worldwide. Rochin (2021) states that higher education institutions (HEIs) must become more actively involved to reduce these negative rates by updating their academic programs, didactic strategies, counseling, and monitoring of students through tutorial programs. In addition, work must be done on the emotional aspect of young people, especially those who are in their first year (para. 1).

The first step that must be carried out within educational institutions is to identify the causes that are generating failure and desertion. For Gopar et al. (2019), the first risk factor for dropout is academic performance. It is necessary to follow up on the evaluations through tutorials and, once vulnerable students are identified, take actions to avoid dropping out of school.

Many studies have been carried out to develop models and instruments that make it possible to detect the factors that may be influencing poor academic performance. Some predictive models even help in decision-making focused on developing strategies to promote student

retention. Such is the case of the study by Castro et al. (2021), in which they analyze demographic, socioeconomic, and academic factors associated with dropout and graduation using a competing risk model. They followed 639 students for fourteen academic terms, and by term fourteen, 35% of students had dropped out. They concluded that the aspects involved in dropout and failure can be controlled by educational institutions.

In the study by Escobedo et al. (2020), an instrument was validated that was adjusted and redesigned to adapt to the needs of the institution, in this case, the Autonomous University of Ciudad Juárez. They chose the DAT questionnaire to measure aptitudes, the QVA-r to measure attitudes, the EME-E, EMPA and CME to measure emotions. Once the survey was applied, they determined that students who obtain a high level of attitudes and aptitudes do not represent a risk of desertion. They concluded that they are still searching for factors involved in desertion and in the development of strategies.

With the present investigation, the development of strategies begins using as a guide the studies carried out in other institutions, following the procedures considered appropriate for the specific problems of the institution. In this case, the psychological factors (because they are the least attended and treated) were analyzed using the scales selected through the review of studies and through a measurement with the Student's t method to identify those that had an impact on academic performance. Once these scales were formed, we proceeded to readjust them and design a single one with the impact factors, in addition to automating it to obtain the results immediately. Subsequently, a report was prepared for the tutoring and psychology area to develop and manage a strategy and to observe the results.

## Conclusion

With this study it was shown that, although the issue of failure and desertion is very extensive and has many intervening aspects, many more studies are needed to delimit or delimit the causes. The importance of starting with a reference point or starting point is also recognized, such as selecting the psychological factors that have received less attention in the institution and designing an automated instrument to obtain immediate results, which serve as a basis for the design and management of strategies. by the department of tutoring and psychology. Once the entire process was carried out, sufficient evidence was found to support the formulated hypothesis: H1. An automated template generates timely information on the

psychological level of first-semester students, which makes it possible to develop intervention strategies and reduce failure and desertion by 2%.

Another point to consider is the monitoring of the academic performance and the socio-emotional aspects of the students, introducing tools within the tutoring and activities of the institution that strengthen their human development. This yields beneficial results, since the young person feels important, understood and even cared for as part of a student community. It is recognized that it is a huge job for a tutor to try to avoid desertion, so this type of study must be incorporated into the tutoring program and continue to measure, evaluate and improve through continuous research. The attention that the institution gives to the problems really generates a positive change, since it implies the involvement of the areas that should be closest to the students.

It is important to point out the limitations of the instrument used. Although the results are a starting point for implementing and developing strategies, they have not been 100% tested in all the institution's programs to demonstrate their universality. However, it represents the beginning of reflection and actions for the institution to develop new research with other variables and even other instruments.

### **Future lines of research**

Once the investigation has been carried out and the importance of developing evaluation instruments, in addition to automated ones, and identifying the causes of failure and desertion have been evidenced, the following lines of investigation can be followed:

1. Apply the unified template to measure psychological factors in all ITSNCG educational programs.
2. Design strategies with the information obtained according to the particularities of each group or program.
3. Analyze the changes that students present after the Covid-19 pandemic, considering that the grades obtained with the analyzed group were with online or virtual classes.
4. Design, develop and implement within the tutorial program a monitoring and evaluation plan for the reports and strategies of psychological factors.



## References

- Alvarado, F. V. del R. (2010). Factores que influyen en el rendimiento académico de los estudiantes de enfermería de la UNMSM-2009. [http://cybertesis.unmsm.edu.pe/bitstream/handle/20.500.12672/539/Alvarado\\_fv.pdf?sequence=1&isAllowed=y](http://cybertesis.unmsm.edu.pe/bitstream/handle/20.500.12672/539/Alvarado_fv.pdf?sequence=1&isAllowed=y)
- Amador, A. J. D., González, G. C. A., Arias, S. M. P., & Carvajal, S. G. (2021). Entorno familiar y deserción escolar: El caso Facultad de Trabajo Social de la Universidad de Colima, México. *Cuadernos de Trabajo Social*, 34(1), Art. 1. <https://doi.org/10.5209/cuts.67348>
- Branden, N. (s/f). Cómo mejorar su autoestima. <https://www.ttmib.org/documentos/Branden-Autoestima.pdf>
- Callejas, Á. F. S., Altamirano, C. R., & Núñez, C. M. E. (2019). Factores causales de la deserción escolar en la BENM (generaciones 2012-2017). <http://www.conisen.mx/memorias2019/memorias/3/P856.pdf>
- Camacho, F. M., Contreras, G. J., & Cortés, L. L. (2011). autoras y datos de identificación <http://www.fca.uach.mx/apcam/2014/04/07/Ponencia%2090-UAEMex.pdf>
- Carrillo, M., Padilla, J., Rosero, T., & Villagómez, M. S. (2009). La motivación y el aprendizaje. *Alteridad*, 4(1), 20-33.
- Castro, M. B. A., Lopera, G. C. M., Manríquez, H. R. D., González, G. D., Castro-Montoya, B. A., Lopera-Gómez, C. M., Manrique-Hernández, R. D., & González-Gómez, D. (2021). Modelo de riesgos competitivos para deserción y graduación en estudiantes universitarios de programas de pregrado de una universidad privada de Medellín (Colombia). *Formación universitaria*, 14(1), 81-98. <https://doi.org/10.4067/S0718-50062021000100081>
- Cortés, V. G. E. (2017). Factores que intervienen en la reprobación de las asignaturas de los estudiantes de primer año de la facultad de ingeniería y arquitectura de la universidad centroamericana José Simeón Cañas. <http://186.151.197.48/tesiseortiz/2017/05/83/Cortes-Guillermo.pdf>

- Escobedo, P. M. T., Hernández, G. J. A., & Gutiérrez, M. V. G. (2020, diciembre 12). Diseño y validación del instrumento de medición [Reporte técnico]. <http://cathi.uacj.mx/handle/20.500.11961/15356>
- García, F., & Musitu, G. (2014). AF-5 Autoconcepto (4a.). [https://web.teaediciones.com/ejemplos/af-5\\_manual\\_2014\\_extracto.pdf](https://web.teaediciones.com/ejemplos/af-5_manual_2014_extracto.pdf)
- Gopar, H. R., Velarde, A. A., Medina, A. L. A., & Correa, A. G. E. (2019). Estrategias para disminuir el nivel de deserción escolar en el IEBO 40 de San Mateo del Mar, Tehuantepec, Oaxaca. Pp. 108-135.
- Himmel, E. (2002). Modelo de análisis de la deserción estudiantil en la educación superior. *Calidad en la Educación*, 17, Art. 17. <https://doi.org/10.31619/caledu.n17.409>
- Iñiguez Fuentes, M. S. (2016). Influencia de la familia en el autoconcepto y la empatía de los adolescentes [Http://purl.org/dc/dcmitype/Text, Universitat de València]. <https://dialnet.unirioja.es/servlet/tesis?codigo=78368>
- Lora, L. M. G. (2020). Actitud, motivación y ansiedad y su relación con el rendimiento académico en estudiantes del Posgrado. *Universidad César Vallejo 2017. Horizonte Médico (Lima)*, 20(1), 37-44. <https://doi.org/10.24265/horizmed.2020.v20n1.06>
- Manassero, M. M. A., & Vázquez, A. Á. (1997). Análisis empírico de dos escalas de motivación escolar. <http://reme.uji.es/articulos/amanam5171812100/texto.html>
- Mares, G., Rocha, H., Rivas, O., Rueda, E., & Cabrera, R. (2012). Identificación de factores vinculados con la deserción y la trayectoria académica de los estudiantes de psicología en la FES Iztacala 17(1). <https://www.redalyc.org/articulo.oa?id=29223246012><https://www.redalyc.org/articulo.oa?id=29223246012>
- Olmos, B. E. (2020). Análisis de los factores relacionados con la deserción escolar en el Instituto Tecnológico de Tlalpan TecNM (2015-2019) [Tesis para el grado de maestría]. <http://riaa.uaem.mx/xmlui/bitstream/handle/20.500.12055/1577/OOBERM05T.pdf?sequence=1>
- Reyes, A. M., Ramírez, V. Y., & García, L. (2017). Factores de la complejidad del estudiante que inciden en la reprobación escolar en licenciaturas del Sistema de Enseñanza Abierta de una universidad pública.

Rochin, B. F. L. (2021). Deserción escolar en la educación superior en México: Revisión de literatura. RIDE. Revista Iberoamericana para la Investigación y el Desarrollo Educativo, 11(22). <https://doi.org/10.23913/ride.v11i22.821>

Secretaría de Educación Pública. (2021). Principales cifras del sistema educativo nacional. [https://www.planeacion.sep.gob.mx/Doc/estadistica\\_e\\_indicadores/principales\\_cifras/principales\\_cifras\\_2020\\_2021\\_bolsillo.pdf](https://www.planeacion.sep.gob.mx/Doc/estadistica_e_indicadores/principales_cifras/principales_cifras_2020_2021_bolsillo.pdf)

Torres-Zapata, Á. E., Rivera Domínguez, J., Flores López, P., García Reyes, M. del P., & Castillo Trejo, D. A. (2020). Reprobación, síntoma de deserción escolar en licenciatura en Nutrición de la Universidad Autónoma del Carmen. RIDE. Revista Iberoamericana para la Investigación y el Desarrollo Educativo, 10(20). <https://doi.org/10.23913/ride.v10i20.602>