











The self-esteem and academic performance of Mechanical and Electrical Engineering's students at the Technological National University of Lima Sur, 2022

[La autoestima y rendimiento académico de los estudiantes de Ingeniería Mecánica y Eléctrica de la Universidad Nacional Tecnológica de Lima Sur, 2022]

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Resumen

El estudio tuvo como objetivo determinar si existe relación significativa entre la autoestima y el rendimiento académico. Por este motivo, se realizó la investigación sobre la autoestima para mejorar el rendimiento académico en la educación superior. El tipo de investigación es aplicada, siendo el nivel de investigación descriptiva y correlacional. La investigación fue transversal; puesto que se realizó una sola vez la encuesta mediante la técnica del cuestionario y notas. La muestra es aleatoria simple 56 estudiantes. Se demostró que la autoestima emocional y personal ocupa, el 64,3% (36) en el nivel más alto; 21,4% (12) representa la autoestima familiar; 14,3% (8) es el mínimo del estudio. Por lo tanto, la autoestima mejora en el rendimiento académico de los estudiantes; sin embargo, es necesario que los docentes tomen en cuenta en sus clases la autoestima emocional y personal. Se determinó que más del 50% de los encuestados están por encima de 2,00, es decir, tienen una actitud favorable. En promedio los sujetos se ubican en 1,93 (favorable). Asimismo, se desvían con respecto al promedio 0,599 unidades de la escala. Por lo tanto, la autoestima beneficia al estudiante. Por último, se concluye que sí existe una adecuada relación significativa entre autoestima y el rendimiento académico de los universitarios, debido a que $9,4877 > 4,445$; entonces, se acepta la Hipótesis nula y se rechaza la hipótesis alterna, es decir es favorable.

Palabras clave: Autoestima, rendimiento académico, emocional, social, familiar.

Abstract

The study aimed to determine if there is a significant relationship between self-esteem and academic performance. For this reason, research on self-esteem was carried out to improve academic performance in higher education. The type of research is applied, being the level of descriptive and correlational research. The research was cross-sectional, since the survey was carried out only once using the technique of the questionnaire and notes. The sample is simple random 56 students. It was shown that emotional and personal self-esteem occupies 64.3% (36) at the highest level; 21.4% (12) represent family self-esteem; 14.3% (8) is the minimum of the study. Therefore, self-esteem improves in the academic performance of students; however, it is necessary that teachers consider emotional and personal self-esteem in their classes. It was determined that more than 50% of the respondents are above 2.00, that is, they have a favorable attitude. On average, the subjects are located at 1.93 (favorable). Likewise, 0.599 scale units deviate from the average. Therefore, self-esteem benefits the student. Finally, it is concluded that there is an adequate significant relationship between self-esteem and the academic performance of university students, since $9.4877 > 4.445a$; then, the null hypothesis is accepted and the alternative hypothesis is rejected, that is, it is favorable.

Keywords: Self-esteem, academic performance, emotional, social, family.

I. Introduction

Currently, self-esteem is considered one of the main problems in young students, regardless of their grade or academic level, which affects their academic performance at university. It should be noted that they fail to achieve the expected skills and abilities during classes, because they have low self-esteem in their learning process, where often unsatisfactory results, presenting cases of disapproval, loss of interest, abandonment of the course, anxiety, insecurity and disinterest in learning. For this reason, it is of interest to know and identify the main problems that affect students to obtain a good or bad grade. According to Nicho (2013) in the research, he found that there is a dependency, in addition to a strong and direct association between self-esteem and the academic performance of students, as evidenced by the calculated p-value that is less than statistical significance ($p = .000 < \alpha = .05$). In addition, it determined that 60% of the students have a low self-esteem that, although they do not believe they are inferior to the rest of their classmates, they do consider that they are in a higher position than theirs. (p.76).

In the study population, self-esteem is not a causal variable for low or high academic performance, since most of them have a good level of self-esteem, regardless of the grade they obtained; However, the same does not happen with study habits, as according to the results of the study and previous research, if it is a variable that is related to academic performance, therefore, better student performance is expected if their techniques are improved study (Chilca, 2017, p.20). The study allows us to visualize the importance that work plays in young students, who show greater self-esteem when they enter the labor market and combine this activity with their studies. These findings have implications for educational systems, which are seen in the prevailing need to guarantee their graduates a quick and efficient insertion into the labor market, which implies an adaptation of the curricula to social needs; therefore, both men and women must look for opportunities that allow them to live with others and develop fully, which will lead them to feel as subjects of value (Ancer et al., 2011, pp.9-10).

In relation to the hypothesis presented about the correlation between academic stress and self-esteem levels, the results of the present investigation come to denote that, on the one hand, there is a moderate level of academic stress in university students of the evaluated population; as well as the presence of relevant low levels of self-esteem. In addition, it is inferred that, although there are significant results in the frequency of each of the variables, it is concluded that there is no

correlation between them (Jerez, 2022, p.64). In accordance with the proposed objective of knowing the relationship between psychological well-being and academic performance in university students, it can be shown that there is indeed a relationship between them. However, it can be seen that this correlation is not considered for all well-being dimensions. Given these results, it is mentioned, academic performance is related in this case to the mastery that students have of their own environment and with their personal growth, in another of the significant results. It was shown, there is a positive relationship with positive relationships and autonomy (Alvarez & Valenzuela, 2022, p.12).

On the other hand, the research on academic performance through the specific analysis of the social ability and self-control variables, with which it opens a space for reflection on evaluation and curricular design for educational institutions, as well as an opportunity to carry out carry out studies in the area of construction of technique and instruments for its prediction. And integrated understanding in an inductive and deductive way through a holistic perspective. (Navarro, 2003, p.14).

The results obtained seem to show that the use of formative assessment systems has a positive influence on improving the academic performance of students, especially with regard to a high percentage of "passes" and a low percentage of dropouts ("not presented"). On the other hand, comparing the academic performance based on the learning and assessment pathway chosen by the students, the data seem to show a notably higher academic performance in the continuous and mixed pathways than in the final exam pathway, as a reflection of a better process. of learning (Aranda et al., 2013, p.10).

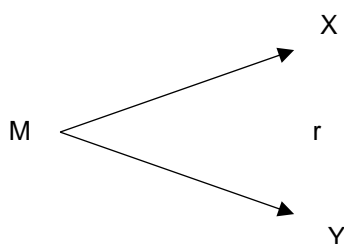
For this reason, research on self-esteem was carried out to improve academic performance in higher education. The objective was to determine if there is a correlation between self-esteem and academic performance. It is also necessary to mention the purpose of this research is to promote self-esteem in classes to improve the academic performance of university students.

II. Materials and Methods

Type of research

The research is applied (since existing theoretical approaches have been applied), with the level of research being descriptive and correlational (since the behavior of the variables analyzed has been described in order to later correlate them). The research was cross-sectional; since it was carried out only once and applied the mixed method for interpretation and analysis.

It respond to the following scheme:



Where:

M: sample

X: self esteem

Y: Academic performance

r: Correlation

Population

According to Hernandez et al. (2014) indicated about this section "that it refers to the group of concordant cases with a row of precisions, and that are accommodated in relation to their contents, place, characteristics and time" (p.174). It consists of 450 students enrolled in the 2022-2 semester, which constitute the study population of the Technological National University of Lima Sur.

Sample

The sample was the Mechanical and Electrical Engineering' students at the Technological National University of Lima Sur. For the determination that reflects a high degree of reliability and low percentage of error, the following statistical formula was used:

Formula

$$n = \frac{\left[\frac{z - \alpha/2}{d} \right]^2 \cdot p (1 - p)}{1 + 1/N \cdot \left[\frac{z - \alpha/2}{d} \right]^2 \cdot p (1 - p) - 1/N}$$

Where:

n = sample size

N = population size, total number of students = 450 (enrolled, 2022-2)

z = value corresponding to the Gaussian distribution = 1.96 for $\alpha = 0.05$

p = expected prevalence of the parameter to be evaluated. As in this case it is unknown, applying the most unfavorable option ($p = 0.5$), which makes the sample size larger.

q = 1-p ($p = 50\%$, $q = 50\%$)

d = precision error (in this case we want 12.1%)

α = significance level of 0.05

$$n = \frac{\left[\frac{1.96 - 0.05/2}{0.145} \right]^2 \cdot 0.5 (1 - 0.5)}{1 + 1/450 \cdot \left[\frac{1.96 - 0.05/2}{0.145} \right]^2 \cdot 0.5 (1 - 0.5) - 1/450}$$

The number of students is:

$$63.9339014 / 1.13985311 = 56.0895966 = 56$$

Data Collection Techniques

For data collection, survey techniques were applied a questionnaire and student notes for self-esteem to improve the academic performance of students in higher education, 2022.

Statistical analysis

For data analysis, descriptive and inferential statistics were used for the hypothesis test, Pearson's Chi Square; then they were processed; Subsequently, the frequencies and percentages were tabulated and found and presented in the corresponding tables and graphs. The statistical analyzes were carried out with the SPSS (Statistical Package for Social Sciences) version 24; which is an instrument developed by the University of Chicago, which is the most widespread and used among researchers in Latin America. For this, the Excel program was used, which allowed the results to be presented in a clear and objective manner.

Procedures

The evaluations were carried out as follows:

- 56 students were taken as a representative sample of the Mechanical and Electrical Engineering' students at the Technological National University of Lima Sur.
- A 25-question survey was prepared with three distractors for the answer (yes, sometimes, no), (see annex 1).
- The investigation was carried out from 01 to 11-30-2022, where the survey was applied and the notes of the course taught were considered to contrast.
- 17 women and 39 men participated with an average age of 19 to 22 years corresponding to the first cycles.
- Obtained the data through the survey and notes, they were processed through basic and inferential statistics and tables were prepared for their interpretation and analysis.
- Finally, the Pearson chi-square hypothesis test was carried out to measure the relationship of both study variables.

III. Results

The frequency analysis of the scores achieved after applying the instruments in students was tabulated and then a scale was obtained to be able to interpret the charts and graphs as shown in Table 1.

Table 1. Levels of the application of self-esteem

		Self-esteem			
		Frequency	Percent	Valid percent	Cumulative percentage
Valid	Family self-esteem	12	21,4	21,4	21,4
	Emotional and personal self-esteem	36	64,3	64,3	85,7
	social self-esteem	8	14,3	14,3	100,0
Total		56	100,0	100,0	

Table 1 shows that of the total number of respondents, the family self-esteem level is 21.4% (12), emotional and personal self-esteem occupies 64.3% (36) at the highest level. Low self-esteem sometimes prevents the realization of many personal projects. That is why it is necessary that from basic education the development of self-esteem is encouraged during the different learning activities. (Bustanza et al., 2017, p.9). It is observed that self-esteem increased significantly in all dimensions, that is: social self-esteem, academic/work self-esteem, home self-esteem and general self-esteem, after completing the leadership course. This could be due to the leadership training carried out, whose theoretical-practical methodology, using dynamics such as Socratic questioning, cognitive recontextualization, training and expressive writing, which were aimed at increasing the aforementioned types of self-esteem. (Ruiz, et al., 2019, p.6).

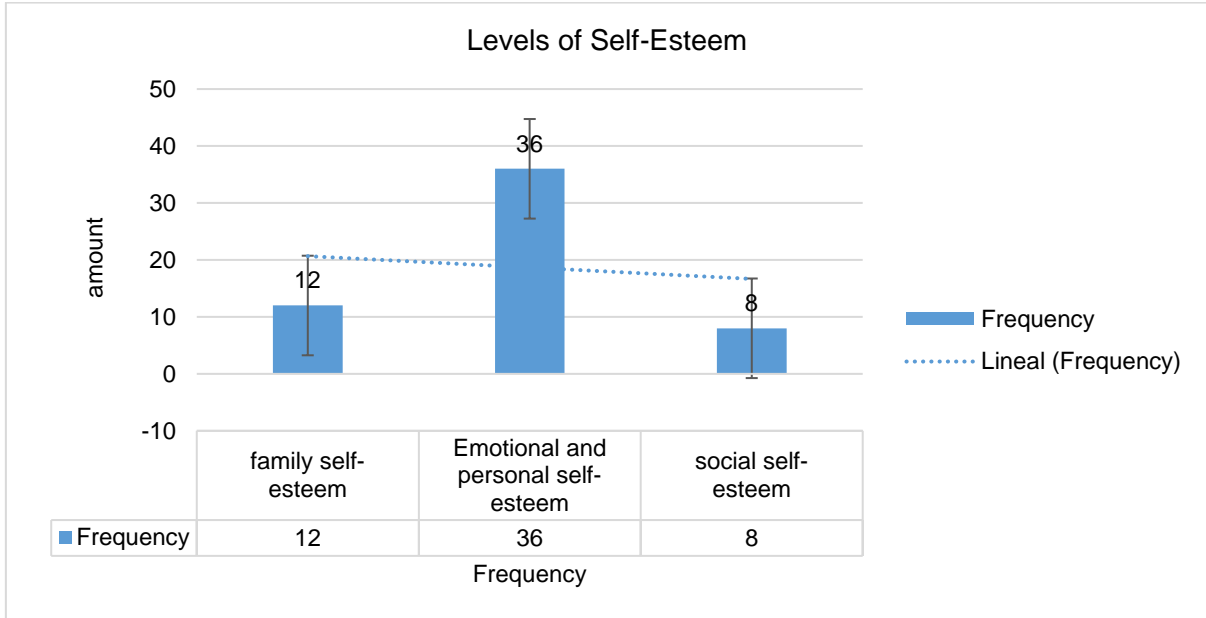


Figure 1. Levels of self esteem

Table 2. Academic performance levels

Academic performance					
		Frequency	Percent	Valid percent	Cumulative percentage
Valid	Low	12	21,4	21,4	21,4
	Medium	43	76,8	76,8	98,2
	High	1	1,8	1,8	100,0
	Total	56	100,0	100,0	

Table 2 shows that of the total number of respondents (56 students), 21.4% (12) represent a low level, 76.8% (43) represent a medium level, and 1.8% represent a higher level.

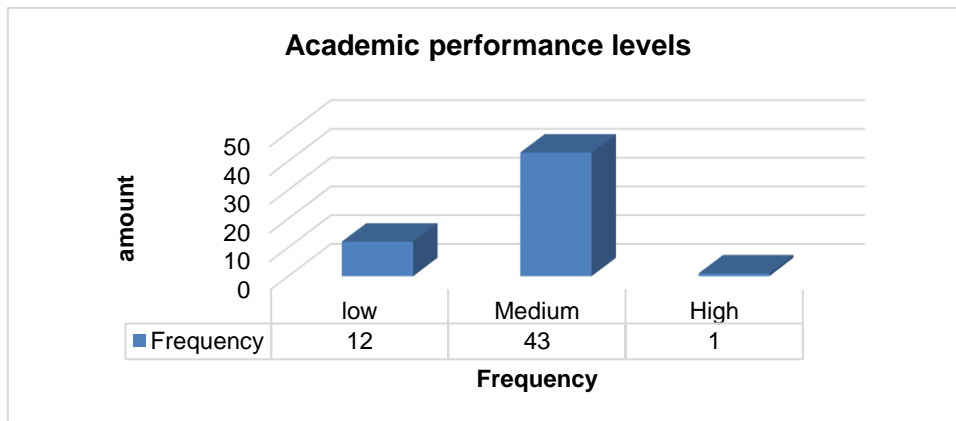


Figure 2. Academic performance levels

Measures of central tendency of the application of self-esteem and academic performance according to the students.

Table 3. Levels of the application of self-esteem

N°	Valid	41
Mean		1,93
Median		2,00
Mode		2
Standard deviation		0,599
Mínimum		1
Maximum		3

The attitude of the respondents towards the self-esteem application is favorable. Being the value that is repeated the most 2 times. More than 50% of those surveyed are above 2.00, that is, they have a favorable attitude. On average, the subjects are located at 1.93 (favorable). Likewise, the standard deviation is 0.599. A minimum score of 1 and a maximum of 3 was observed. According to the data obtained in the measures of central tendency, there is a favorable attitude regarding the application of teamwork. The analysis by sex showed that women had a higher mean self-esteem score than men, although this difference was not statistically significant. It is considered that the main limitation is related to the evaluation procedures of the self-esteem construct, an issue that could be improved in future works by including other self-report measures or other evaluation methods that allow examining the nomological validity of self-esteem (Caballo et al. 2018, p.28).

Analysis of the independent and dependent variables

Table 4. Self-esteem vs academic performance crosstabulation

		Self-esteem * Academic performance crosstabulation				
		Academic performance			Total	
Self-esteem	Yes	Low	Medium	High		
			Count	2	9	1
	% of total	3,6%	16,1%	1,8%	21,4%	
	Sometimes	Count	9	27	0	36
	% of total	16,1%	48,2%	0,0%	64,3%	
	No	Count	1	7	0	8
	% of total	1,8%	12,5%	0,0%	14,3%	
Total	Count	12	43	1	56	
	% of total	21,4%	76,8%	1,8%	100,0%	

Based on Table 4, on the crosstabulation of the self-esteem and academic performance variables, the following data is available: 48.2% (27) are between sometimes and a half times; 16.1% (9) between themselves and a half; while 12.5% (7) are between no and medium. Academic performance is located in the middle item, with a total count of 76.8% (43), according to the summary of 100%.

In conclusion, the results of this study support a multidimensionality of self-esteem, although all its dimensions would be related to a global concept of it. However, more studies would be needed to confirm the stability of the factors found in the investigation and expand the data referring to their validity. On the other hand, the relationship found between self-esteem and social anxiety seems moderate, both globally and in its dimensions, while with respect to social skills, only the magnitude of the relationship is maintained globally, decreasing significantly, or even disappearing on occasions, the relationships between the dimensions of both constructs (Caballo et al. 2018, p.28).

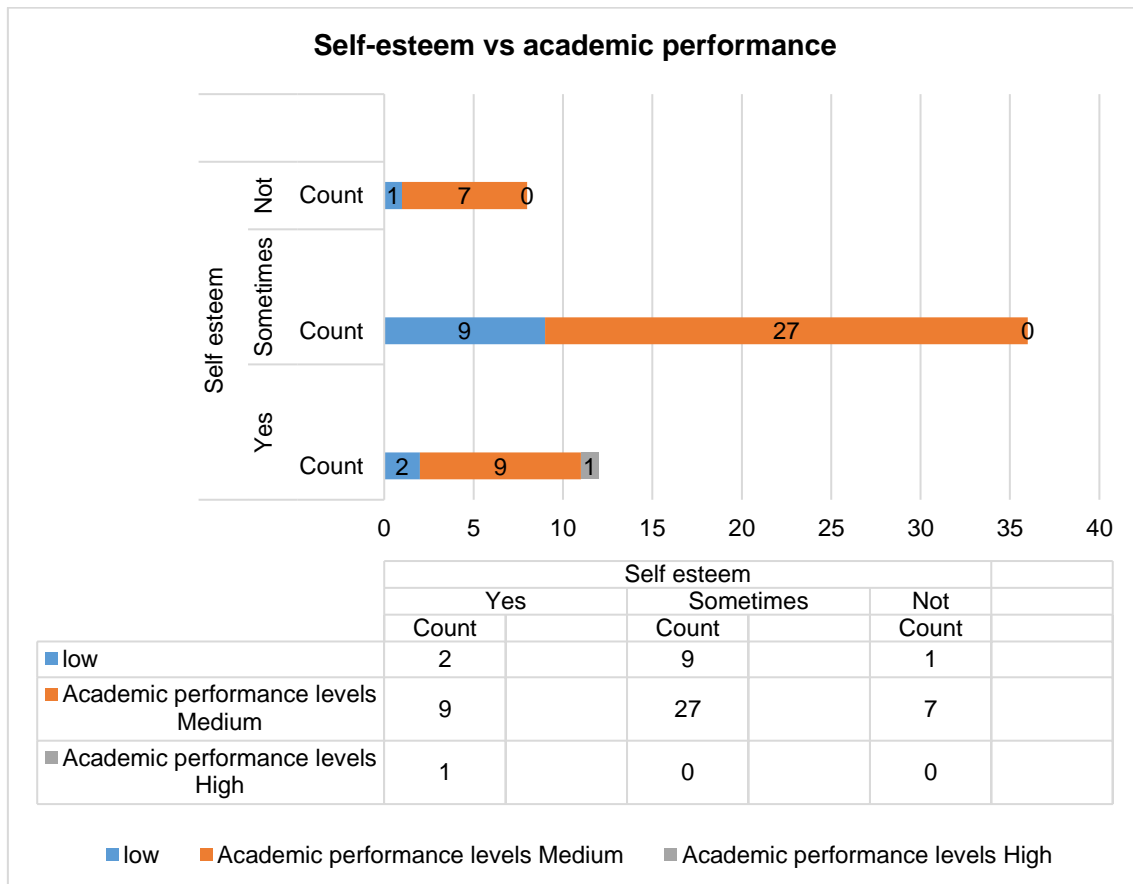


Figure 3. Self-esteem vs academic performance crosstabulation

Normality test

Before carrying out the respective hypothesis test, we will first determine if there is a normal distribution of the data (parametric statistics) or not, that is, a free distribution (non-parametric statistics). For this purpose we will use the Kolmogorov Smirnov normality test (n>50).

Table 5. Normality Test

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Self-esteem	,333	56	,000	,761	56	,000
academic performance	,457	56	,000	,586	56	,000

a. Lilliefors Significance corrections

The normality test shows that both variables are not distributed according to a normal law, since the sig. asymptot of both variables is 0.000, that is, for the self-esteem group, it is below the predetermined alpha significance level (0.05). Therefore, for the variable academic performance is 0.000, it is below the predetermined alpha level of significance (0.05). Which means that it is a non-parametric test. Therefore, the data does not come from normal populations, since they present a percentage of less than 5%.

General hypothesis

a) Statement of the hypothesis

There is a significant relationship between self-esteem and academic performance of the Mechanical and Electrical Engineering’s students at the Technological National University of Lima Sur.

H1: Yes, there is a significant relationship between self-esteem and academic performance of the Mechanical and Electrical Engineering’s students at the Technological National University of South Lima.

Ho: There is no significant relationship between self-esteem and academic performance of the Mechanical and Electrical Engineering’s students at the Technological National University of South Lima.

b) Establishes the confidence level

95% confidence level

c) Establishes the level of significance

5% (p-value < 0.05).

d) Choice of statistic

To test the hypotheses, the Chi-square test of independence was performed, according to the following statistical model:

$$\chi^2 = \frac{(n_{11} - e_{11})^2}{e_{11}} + \frac{(n_{12} - e_{12})^2}{e_{12}} + \dots + \frac{(n_{rs} - e_{rs})^2}{e_{rs}} = \sum_{i=1}^r \sum_{j=1}^s \frac{(n_{ij} - e_{ij})^2}{e_{ij}}$$

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^s \frac{(n_{ij} - e_{ij})^2}{e_{ij}} \rightarrow \chi_{(r-1)(s-1)}^2$$

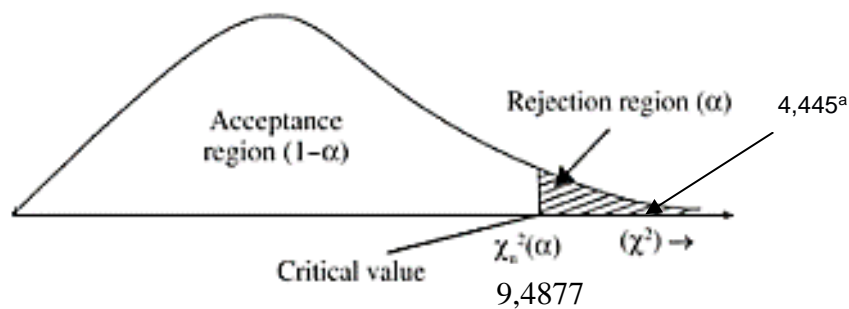
Table 6. Chi-square tests.

Chi-square tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-square	4,445 ^a	4	,349
Likelihood Ratio	3,907	4	,419
Linear-by-Linear Association	,159	1	,690
N of valid cases	56		

a. 5 cells (55,6%) has expected count less than 5. The minimum expected count is, 14.

The critical value of $\chi^2_{1-\alpha}$; in Chi-square table is:

$$\chi^2_{(0.05)} = 4,445^a$$



e) We compare the critical value with the calculated value, $\chi^2 = 9.4877$ then: $9.4877 > 4.445a$; then, the null hypothesis is accepted.

From the result obtained, it is concluded that there is a significant relationship between self-esteem and academic performance in students, with a confidence level of 95%. University students have adequate self-esteem and are capable of solving conflicts; however, there is also a number of adolescent students with inadequate self-esteem, making it necessary to educate, provide psychological and comprehensive treatment to modify risk behaviors and avoid inadequate interpersonal relationships (Valdivia et al. 2020, p.21). The study allows us to visualize the importance that work plays in young students, who show greater self-esteem when they enter the labor market and combine this activity with their studies (Ancer et al., 2011, pp.9-10).

IV. Conclusions

- It was shown that emotional and personal self-esteem occupies 64.3% (36) at the highest level; family self-esteem occupies 21.4% (12); the minimum of the study 14.3% (8). Therefore, self-esteem improves in the academic performance of students. However, it is necessary for teachers to take self-esteem into account in their classes, since emotional and personal self-esteem is the most representative.
- It was determined that more than 50% of the respondents are above 2.00, that is, they have a favorable attitude. On average, the subjects are located at 1.93 (favorable). Therefore, self-esteem benefits the student.
- Finally, it is concluded that there is an adequate significant relationship between self-esteem and the academic performance of university students, because $9.4877 > 4.445a$; then, the null hypothesis is accepted and the alternate hypothesis is rejected.

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Annex 1. Questionnaire

Dear Student:

This questionnaire is to find out how your self-esteem is, among your family and your peers. Your answers are personal and nobody will know them, so answer the statements calmly and sincerely, mark with a cross (X) the alternative you want.

Evaluation scale

Code	Category	
Y	Yes	3
ST	Sometimes	2
N	No	1

Nº	Variable 1: Self-esteem			
	Dimension 1: Family self-esteem	Yes	Sometimes	No
1	I get annoyed all the time at home.			
2	My family demands too much of me/expects too much of me.			
3	My feelings are respected in my house.			
4	There have been times when I have wanted to leave my home.			
5	I think that in my home they understand me.			
6	They annoy me too much in my house			
	Dimension 2: Personal self-esteem	Yes	Sometimes	No
7	I would like to be born again and be different from who I am now.			
8	There are things inside of me that I would change if I could.			
9	I think my life is very sad.			
10	I have a very low opinion of myself.			
11	I think I am an ugly person compared to others.			
	Dimension 3: Emotional self-esteem	Yes	Sometimes	No
12	Making decisions is difficult for me.			
13	I find it hard to get used to something new			
14	If I have something to say to others, I fearlessly go and tell them.			
15	I consider that I am a cheerful and happy person.			
16	I have anger / anger at myself many times.			
17	I feel like other people don't like me.			
18	I feel like I have more problems than other people.			
19	I think I have more defects than qualities.			
	Dimensión 4: Social self-esteem	Yes	Sometimes	No
20	Others listen to me and consider my ideas.			
21	I often feel tired from everything I do.			
22	When I try to do something, very quickly I get discouraged.			
23	I find it very difficult to speak in front of a group.			
24	I am a popular person among people my age.			
25	I do what my friends tell me to do.			

¡Thank you for your collaboration!