Attitude, Motivation, Anxiety, and Academic Performance During the Learning Process in Students at Public Universities in Peru

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*The knowledge society requires universities to prepare professionals with autonomy during training. It was proposed to relate the attitude, motivation, anxiety, and academic performance during the learning process in students at public universities in Peru, comparing the results according to gender, area, and cycle of studies. The study was descriptive-correlational-comparative, quantitative, and cross-sectional. 792 students from two public universities in Peru participated, intentionally selected, applied a duly validated scale to collect information. A correlation ($p < .05$) was found between attitude, motivation, anxiety, and academic performance during the learning process in students of public universities in Peru, being the statistically significant correlation of direct mean level between academic performance and attitude (.445**) and between academic performance and motivation (.438**), for the variables academic performance and anxiety, a statistically significant correlation of low and inverse level (-.225**) was found. It is concluded that the student who presents a greater attitude towards science has more excellent academic performance, that greater motivation has greater academic performance, and that greater anxiety, lower academic performance.*

Keywords: attitude, motivation, anxiety, academic performance, learning, university students

INTRODUCTION

The current knowledge society demands that universities prepare professionals with autonomy during the training process, strengthening students' capacities through motivation and actions, including planning skills and self-evaluation of knowledge and results (Pérez et al., 2013). In this sense, the difference between successful students and students who tend to fail occurs because the former better manage their self-regulation abilities, develop their study skills and control their learning behaviors. In addition, in unsuccessful students, reasons can include the existence of family socioeconomic problems, absence of learning objectives, inadequate management of time to study, poor study habits, leaning more towards leisure than academia (Gómez et al., 2018).

The theoretical model proposed by educational psychology raises issues such as the role and interest in learning, the need to adapt teaching to the capacity of the student, autonomy as a principle of learning, and the self-evaluation of the student by their results without comparing with others. All these processes does not occur naturally in the student, being necessary the participation of the teacher in this educational process to strengthen, motivate and encourage participation through the methodological and pedagogical application that this demands (Paz & Peña, 2021).

There is no contradiction in the conceptual definition of the study variables. First, attitudes toward science are cognitive structures that allow students to discern and define the positive or negative and the favorable or unfavorable about how productive science can be in the learning process (Serje et al., 2021). Secondly, learning motivation results from applying an attractive didactic strategy that encourages students to obtain and achieve their academic goals (Vargas, 2021). Thirdly, anxiety about academic work is defined as an emotional state experienced by the student in situations that may threaten to achieve their goals. In addition, the high anxiety caused by the academic load can reduce learning efficiency (Mosqueira-Soto & Poblete-Troncoso, 2020).

Therefore, attitudes towards science, especially in curricular content, learning, and social implications, as well as motivation factors in both intrinsic and extrinsic learning and the anxiety that occurs before academic work, can constitute variables that hinder or favor academic performance (Lora, 2020; Moral et al., 2022).

Concerning academic performance is the value attributed to learning outcomes, and the classic way of measuring performance is through grades expressed in numbers (Gutierrez-Monsalve et al., 2021). However, this measurement should not only be expressed in this way. Aspects such as aptitude should be considered, such as the use, achievements, success, or failure depending on the results achieved, and define a motivational strategic plan (Cervantes et al., 2020; Vicente et al., 2023).

Likewise, academic performance in higher education is quite complex, taking into account that some aspects such as the study profile differs in the academic programs, as well as the curricular contents. The

levels of demand in some subjects are usually different, and no parameter can filter these differences (Barca-Lozano et al., 2019). Therefore, it is induced that some psycho-pedagogical models (to improve learning) can recognize that students' grades are influenced by academic, pedagogical, psychological, socio-family, and identity variables (Jiménez, 2022; Alducin-Ochoa & Vázquez-Martinez, 2017; Daza-Corredor et al., 2023).

In addition, academic failure is not presented by the lack of intelligence or lack of ability to learn, or by the low quality of teaching received. Rather, it is by personal reasons of the student related to their emotions and feelings, experiencing chronic anxiety, lack of motivation to work in groups, fear of obtaining negative results in grades (failing subjects), and too much concern to fulfill their academic activities and the tension of assuming so much academic load. These can, in many cases limit the reflective, scientific and professional performance that is required in academic training (De La Fuente et al., 2021; Sucari, 2022).

From the review of previous studies in recent years on the variables of interest in Peru, few investigations have related them, the most relevant (Lora, 2020) indicating that there is a direct positive correlation between attitude and motivation concerning the academic performance presented by the student. However, studies were conducted independently on attitudes towards science, on motivation to learn, on anxiety to academic work and performance relating it to other variables during the learning process (Chambi-Choque, 2020; Gonzalez, 2021; Castillo et al., 2021).

In this sense, after describing the current situation on the research topic, it is of particular interest to researchers to know the behavior of the study variables in the performance presented by students, to understand the processes that may benefit or limit the student in the teaching-learning process.

Therefore, it was proposed to relate the attitude, motivation, anxiety, and academic performance during the learning process in students of public universities in Peru, comparing the results according to sex, area, and cycle of studies.

METHODOLOGY

The study was correlational with the determination of measuring two or more variables, establishing a statistical relationship between each of them, likewise, the results were compared according to the sex, area and cycle of the student. The research approach was quantitative; and the design was non-experimental of a cross-sectional of the expost facto type (Calizaya et al., 2022), data was obtained from September to November 2022.

PARTICIPANTS

792 students from two public universities in Peru participated, intentionally selected, including students with enrollment updated to 2022, who attend face-to-face classes, as well as studying in the areas of engineering, health, and social science, of both genders (men and women), of the first three years or academic cycles, excluding students of the last cycles who were doing pre-professional practices and it was difficult to contact them.

INSTRUMENT

The instrument of evaluation of psychological characteristics (IPRI) validated for Peru by Vallejos (2012) was applied. The scale aims to collect information on the attitude towards science, motivation to learn, and anxiety about academic work. This information is of great importance for the timely detection of possible learning problems and their impact on academic performance. 48 items structure the instrument, and 4 dimensions (attitude, motivation, amotivation, and anxiety). the distribution of items by dimensions in the questionnaire was as follows: 16 on attitude (4 on attitude towards content, 8 on attitude towards learning and 4 on attitude towards social implications), 12 on motivation (8 on intrinsic motivation and 4 on extrinsic motivation), 5 on amotivation, and 15 on anxiety (7 on anxiety according to state and 8 on anxiety according to traits).

For the variable academic performance, a self-assessment question on the level of performance was included in the scale. According to the vigesimal evaluation in Peru, the following ranges and levels were established: < to 10 (low performance), from 11 to 15 (regular performance) and from 16 to 20 (high performance). Likewise, some other social and academic variables were included, such as age, gender, area of studies, university cycle, and the respective informed consent data.

For the instrument's adequacy to the selected sample, the reliability levels of the scale were obtained by the method of internal consistency with McDonald's ω test. Therefore, the instrument has good reliability when the ω values ≥ 0.700 (Revelle, 2019), finding on the general scale ω = 0.837. According to the rules of interpretation, the instrument is quite reliable. Likewise, for the variable attitude towards science ω= 0.8 29; variable motivation to learning ω= 0.833; variable amotivation ω= 0.809; and variable anxiety before academic work ω= 0.844.

PROCEDURE

For the application of the instrument to the sample, first, authorization was requested from the managers. Then, coordination was made in each area of study to establish some schedules to facilitate the application. The instrument was applied directly and in person, taking into consideration the guide provided by the original author. Likewise, the participant was informed about the objective of the research, The instructions of the scale affirmed about the confidentiality of the data provided. Finally, their informed consent was sought, with them agreeing to participate voluntarily by signing the respective document.

DATA ANALYSIS

Data were entered into a database first and analyzed through distribution, asymmetry, kurtosis, and normality tests, with the Shapiro-Wilk test evidencing that there is no normal distribution ($p<.001$). Then, the homogeneity of variance tests was performed (they are not equal). Concluding that, of the results obtained, it was considered to use non-parametric statistics. Descriptive analysis was performed on the attitude toward science, motivation to learn, and anxiety about academic work, and comparative analysis was conducted according to age, sex, area of studies, and academic cycle.

The following statistics were used: The Mann-Whitney U (Ventura, 2016) was used to compare two independent samples, the k-independent samples were compared with Kruskal Wallis' H and Pos Hoc tests (Tomczak & Tomczak, 2014); and, the non-parametric statistician Spearman's Rho (Pagano, 2006) was used to determine the correlations. The statistical analysis was performed in the JAMOVI program version 1.2.27.

RESULTS

The social and academic variables of the university students were analyzed, obtaining the following descriptive information: according to gender, 56.3% were men and 43.7% women. The mean age was 17.11 years with a standard deviation of 0.917 in a range of 16 to 19 years. According to the area of studies, 30.9% are engineering, 43.8% of Social Sciences and 25.3% of Social Sciences. Likewise, 29% are of the first year or cycle, 42.6% of the second year or cycle and 28.4% of the third year or academic cycle.

TABLE 1
NUMERICAL DESCRIPTIVE ANALYSIS OF THE ATTITUDES PRESENTED BY STUDENTS DURING THE ACADEMIC LEARNING PROCESS

Attitudes	A	SD	Rank		Assessment
			Min.	Max.	
Attitude towards science	47.03	5.51	21	64	Favorable
Attitude towards content	11.71	2.02	4	16	Favorable
Attitude towards learning	24.81	3.47	10	32	Favorable
Attitude towards social implications	10.52	1.69	4	16	Favorable

Note. A= Average; SD= Standard deviation.

The table describes the assessment of the attitudes presented by students during the academic learning process, finding a favorable attitude in the attitude towards science and its dimensions contents, learning, and social implications, evidencing an adequate behavior, skill, and/or capacity on the part of most students towards their professional careers.

TABLE 2
NUMERICAL DESCRIPTIVE ANALYSIS OF THE LEVEL OF MOTIVATIONS AND AMOTIVATIONS STUDENTS PRESENTED DURING THE ACADEMIC LEARNING PROCESS

Motivation and Amotivation	A	SD	Rank		Assessment
			Min.	Max.	
Learning motivation	30.60	3.67	18	56	Moderate
Intrinsic motivation	21.50	2.87	13	47	Casualty
Extrinsic motivation	9.09	1.62	4	16	Moderate
Amotivation	13.88	2.06	7	24	Moderate

Note. A= Average; SD= Standard deviation.

The table describes the assessment of the level of motivation and amotivation presented by students during the academic learning process, finding moderate motivation (medium level) in the motivation to learn and in the dimension extrinsic motivation. However, the intrinsic motivation was found at a low level, observing that during the learning process, the process is not active and consciously obstructing the development of directed activities to improve academic performance. With amotivation, students presented a moderate level, concluding that most students do not demonstrate their actual capacity, strategies, and resources to face their learning tasks.

TABLE 3
NUMERICAL DESCRIPTIVE ANALYSIS OF STUDENTS' ANXIETY LEVEL DURING THE ACADEMIC LEARNING PROCESS

Anxiety	A	SD	Rank		Assessment
			Min.	Max.	
Anxiety about academic work	29.06	7.77	15	57	Severe
Anxiety by state	14.53	3.74	7	49	Severe
Trait anxiety	14.53	4.85	8	30	Severe

Note. A= Average; SD= Standard deviation.

The table describes the level of anxiety presented by students during the academic learning process, finding severe levels of anxiety before academic work, as well as severe anxiety according to the state and traits, observing adverse emotional reactions in most students to the expectations of the learning process, due to the large number of works assigned per subject, demands in the workshops and little understanding on the part of the teachers.

TABLE 4
SELF-ASSESSMENT OF THE LEVEL OF ACADEMIC PERFORMANCE OF UNIVERSITY STUDENTS

Levels	Descriptive	
	f(x)	%
High academic performance	83	10.5
Regular academic performance	645	81.4
Poor academic performance	64	8.1
Total	792	100%

Note. f(x)= frequencies; % = percentage.

The table describes the self-assessment presented by the university student on the level of academic performance, finding that 81.4% indicate that they have a regular level of academic performance, with their averages in the vigesimal system of 11 to 15, 10.5% indicating that their level of performance is high (from 16 to 20) and 8.1% considered that their level is low < to 10.

TABLE 5
COMPARISON OF ATTITUDES, MOTIVATIONS, AND ANXIETY PRESENTED BY STUDENTS ACCORDING TO GENDER, AREA OF STUDY, AND ACADEMIC CYCLE

Variables	Gender*		Study area**			Academic year**		
Attitude	Male	Female	Engineering	Social	Health	1st	2nd	3rd
Attitude towards science	.084				*.000*		.985	
Attitude towards content	*.000*				*.000*		.483	
Attitude towards learning	.705				*.008*		.677	
Attitude toward socials implications	.553			.086			.141	
Motivation								
Learning motivation	.554			.140			.810	
Intrinsic motivation	.857			.102			.644	
Extrinsic motivation	*.043*			.375			.802	
Amotivation	.558			.175			.655	

Variables	Gender*		Study area**			Academic year**		
Attitude	Male	Female	Engineering	Social	Health	1st	2nd	3rd
Anxiety								
Anxiety about academic work	.070		.066				.794	
Anxiety by state	.080		.117				.873	
Trait anxiety	.155		.077				.798	
Yield								
Performance level	.830		*.000*					*.004*

Note. *Comparison with the statistician for two independent samples Mann-Whitney U (significance = 0.05). ** Comparison with the statistician for k-independent samples Kruskal Wallis (significance = .05).

When comparing the attitudes, motivations, and anxiety presented by university students according to gender, it was found that there are only statistically significant differences in attitudes towards content, with women tending to present better attitudes than male students; And in extrinsic motivation, it is men who feel more motivated than female students; in the other dimensions of anxiety about academic work, no differences were found.

When comparing the attitudes, motivations, and anxiety presented by university students according to the area of studies, statistically significant differences were found in the attitude towards sciences, content, and learning, with students in the area of health sciences presenting better attitudes than students of engineering and social sciences, however, in the dimensions of motivation and anxiety, no statistically significant differences were found in the comparison groups.

When comparing the attitudes, motivations, and anxiety presented by university students according to academic cycle, no statistically significant differences were found in the comparison groups presenting similar attitudes, motivations, and anxiety levels.

When comparing the level of academic performance according to the gender of the student, no statistically significant differences were found; however, according to the area of studies, significant differences were found, being the students in the area of social sciences who performed better academically than those of engineering and health sciences. Also, according to academic cycle, it is the students of the third cycle who perform better academically than the other students of the comparison groups.

When correlating the variable academic performance with the variables attitude towards science, motivation to learn, and anxiety about academic work, the following significant correlations were found: between academic performance and attitude, $p = .006$ and $r = .455$ ** were found, observing that there is a statistically significant correlation of medium level, direct and 99% confidence. The practical conclusion leads us to the reasoning that the greater the attitude, the greater the academic performance. Between academic performance and motivation, $p = .000$ and $r = .438$ found there is a correlation between the direct average level and 99% confidence, that is, the greater the motivation, the greater the academic performance; and between performance and anxiety was found $p = .001$ and $r = -.225$, there is the correlation of low-level inverse and 99% confidence, concluding that higher academic performance lower anxiety.

TABLE 6
CORRELATION OF THE VARIABLES ATTITUDE, MOTIVATION, ANXIETY, AND ACADEMIC PERFORMANCE

Dimensions of emotional dependence			Academic performance
Spearman's Rho	Attitude	Correlation coefficient	. 445**
		Sig. (bilateral)	.000
		N	792
	Motivation	Correlation coefficient	. 438 **
		Sig. (bilateral)	.000
		N	792
	Anxiety	Correlation coefficient	-. 225**
		Sig. (bilateral)	.001
		N	792

Note. ** The correlation is significant at level 0.01; Sig. = p< .05; N= sample.

CONCLUSIONS

When correlating the study variables, a p< .05 correlation was found between attitude, motivation, anxiety, and academic performance during the learning process in students of public universities in Peru, being the statistically significant correlation of direct average level between academic performance, attitude (.445**) and motivation (.438**). That is, the greater the attitude towards science, the greater the academic performance and the greater the motivation, the greater the academic performance. For the anxiety and academic performance variables, a statistically significant correlation was found from low and inverse level (-.225**) to higher anxiety, lower academic performance.

When comparing the results according to the gender of the student, it was found that in the attitudes towards the contents, it is women who tend to present better attitudes than male students. In extrinsic motivation, it is men who feel more motivated than female students.

When comparing the attitudes, motivations, and anxiety presented by university students according to the area of study, statistically significant differences were found in the attitude towards science, content, and learning, with students in the health sciences presenting better attitudes than engineering students and social sciences.

When comparing the attitudes, motivations, and anxiety presented by university students according to academic cycle, no statistically significant differences were found in the comparison groups presenting similar attitudes, motivations, and anxiety levels.

When comparing the level of academic performance according to the gender of the student, no statistically significant differences were found; however, according to the area of studies, significant differences were found, being the students in the area of social sciences who performed better academically than those of engineering and health sciences. Also, according to academic cycle, the students of the third cycle perform better academically than the other students of the groups of comparison.

The result of learning is evident in academic performance, so it is necessary to know how to identify all the factors that influence students to succeed, from family socioeconomic factors, dynamics, relationships, and coexistence to aspects of curricular design, content, evaluation systems and rules that motivate the student to dedicate themselves to the academy and competent professionals are prepared. In addition, the teacher must be the link so that favorable results are obtained and the prestige of universities increases.

Finally, it is suggested to continue with studies on attitudes, motivations, anxiety, and academic performance in larger samples that include both public and private universities in order to compare the results found and that these serve as a reference to make changes in curricular structures and assist students

academically so that they can improve performance levels, establishing tutoring programs that favor and serve students.

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