Technology anxiety (technostress) and academic burnout from online classes in university students

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CHRONICLE	ABSTRACT
	Pandemic moments have generated mental and emotional problems in students at all levels. These have been affected by the format of virtual classes, the mandatory confinement and the little physical relationship due to the existing restrictions, generating academic burnout and anxiety in university students. In this context, the objective was to know the existing relationship between burnout and anxiety in students of the FIS-UNCP, the 15-question Maslach Burnout Inventory Student Questionnaire (MBI-SS) was used with the dimensions: Emotional Exhaustion, Cynicism and Loss of Academic Efficacy and 5 questions to know the level of technological anxiety or technostress, with a population of 328 university students of 10 semesters, through the questionnaire in Office Forms. The research design was non-experimental, transactional, with a qualitative-quantitative approach and descriptive-explanatory levels. The descriptive data analysis was made based on the scale, allowing the identification of students with burnout and the structural equation modeling facilitated the establishment of the relationship between the variables. The study showed that 26 students (7.93%) suffer from academic burnout. At the same time, it has been demonstrated that there is a positive and significant relationship between emotional exhaustion and lack of academic efficacy, with technological anxiety with path values of 0.701 and 0.345 respectively, the p-values allowed demonstrating hypotheses 1 and 3 formulated. At the level of the structural model, it allows anticipating future results, since the coefficient of determination (R2) calculated was 0.838.

1. Introduction

The search for balance between personal, work, professional, etc. activities is a current concern, especially when, as a world population, we are facing a new situation and with it a new way of being, living, feeling and acting. These are critical times for humanity, because during the fear of Covid19 contagion, daily activities must continue in the economic, business, educational, etc. scenarios. In the case of university students, in recent months, they have been exposed, not only to a new reality, but also to a new way of academic training: the virtual one; and with it, new ways of studying, learning, forming work teams, submitting assignments, and presenting assignments have been constituted.

This new scenario has put them in a situation of vulnerability, anxiety and fear in front of practices and academic formative activities that until then were infrequent and sporadic, so the determination of the level of academic stress and the relationship it has with anxiety is important, as it will allow designing courses of action to reduce these values through actions deployed by the Coordination of Tutoring and Monitoring of Students of the FIS-UNCP.

The concern about stress in university students was manifested by Hernandez et al. (2019) who studied relationships between stress, self-efficacy and academic performance with resilience in young university students; finding that when academic stress increases, resilience levels decrease; the same happened with master's and doctoral students, in which a negative relationship was established between academic burnout and passion for study (Al-Jarrah & Alrabee, 2020).

Similarly, Dios (2018) addressed burnout as a psychological discomfort in students close to becoming teachers, determining that this phenomenon hinders the perception and development of competencies, proposing strategies of a preventive nature in the teaching - learning process. However, according to Ramirez et al. (2020), this involves studying and understanding how teachers manage their emotions in order to have a better performance when teaching their classes.

Understanding the academic burnout syndrome in university students is essential, given that within the dynamics of their own activities, they are subject to permanent changes, pressure for the fulfillment of tasks, carrying out projects and research, etc.; which leads to physical and psychological wear and tear that raise levels of stress, depression, irritability, frustration, among others (García-Flores et al., 2018). Already in pandemic times, Sveinsdóttir et al. (2021) demonstrated that students feel personally and academically exhausted, so it is necessary to strengthen their support networks. The issue of burnout not only occurs at the level of university students, but also at the level of teachers, as indicated by Lozada et al. (2021) who showed a significant relationship between the inappropriate use of instant messaging applications and work overload, and of this with burnout or work stress. It was also established that those students who suffered from burnout associated this condition with superficial levels of learning (Asikainen et al., 2022). Similarly, Biswas & Biswas (2021) found that female students are more anxious than male students, and that the pace of life and academic backlogs are positively associated with anxiety, as well as social support, even recommending the involvement of psychological professionals. A similar study was conducted by Hoque et al. (2021) who found that more than 95% of university students suffered from anxiety caused by the limitations of e-learning. Dangal & Bajracharya (2020) also indicate that female students are more likely to be anxious, at the same time that economic problems affect anxiety levels. Just as burnout and technological anxiety are dangerous and harmful for students, it is also as an occupational hazard for teachers, so mechanisms were established for proper interaction between them (Pyhältö et al., 2021). On the other hand, Pressley (2021) found that those factors that affect teacher burnout are anxiety about the disease itself, the way of teaching, weak communication with students and parents, and little administrative support. In the same sense, Alcas et al. (2019) mention that the situation, perception and management of information technologies have an impact on people's work performance. The influence of technostress not only affects student and teacher performance, but also affects work environments, and Olvera et al. (2022) established an inverse relationship between levels of job satisfaction and technostress, with variables such as the type and workload, digital competencies and workers' margins of action and control being equally important.

Considering that by government disposition, the population was confined to quarantine, in addition to the fact that academic and administrative processes have been carried out remotely through digital platforms, classes went from a face-to-face format to a virtual format, new equipment and technological services had to be acquired, among others. University actors, especially students, have been experiencing a new lifestyle, so knowledge of burnout levels and their relationship with technological anxiety or technostress provides information to implement actions with the University Welfare Office of UNCP to improve the physical, mental and emotional health of the student population.

2. Literature review

2.1 Modeling based on structural equations

When referring to structural equations, this refers to the set of multivariate statistical models, through which relationships are sought to be established and the effects between the variables that make up the model are measured and the direct or indirect relationships and effects between the variables under study are established (Ruiz, 2010). Byrne (2020) mentions that by means of structural equation models, it is possible to design and test from a statistical perspective, the nature, dimension and direction of the relationships proposed in the model, with which indicators and parameters can be estimated, in the search for hypothesis testing or theoretical validation of the model.

2.2 Burnout or academic exhaustion

Burnout syndrome, being burned out or exhausted, is a term coined by Freudenberger (1974), through which reference is made to a situation of emotional and physical discomfort of a worker, having work stress as a direct cause; this definition has also been endorsed by the World Health Organization, which has considered it within the International Classification of Diseases (ICD-11). There is consensus among academics that this syndrome is a consequence of chronic stress, with negative consequences at the level of individuals, organizations and societies (Martínez, 2010). On the other hand, the United Nations Organization (UN) has raised The 2030 Agenda for Sustainable Development, in which it considers the care of the mental and bodily health of people and workers in order to ensure their quality of life and emotional stability (United Nations, 2018).

2.3 Emotional exhaustion

Maslach et al. (2001) define it as the feeling of emptiness and abandonment that a person has, known as a "feeling of emptiness and abandonment", this tiredness or fatigue is usually generated by work. The progressive loss of energy causes the individual to lose interest in what he or she does (Martínez, 2010). For the purposes of this research, this emotional exhaustion could be considered as the loss of illusion or emptiness of the future of university students.

2.4 Cynicism or depersonalization

In the context of student behavior, it is considered as the negative response to self-criticism, loss of individual value, loss of the ability to respond with a self-critical attitude, loss and devaluation of interest in daily activities and assignment of insignificant values to study, which leads to making minimal efforts (Gil-Montes, 2002). For Lee et al. (2020) cynicism is considered as the cognitive dimension of burnout, also configured as an ineffective way of facing reality, which manifests itself in negative, pessimistic, distant and indifferent attitudes, resulting in detachment from academic activities. This situation generates a gap between the expectations that university students have and the reality that they experience (Wei et al., 2015).

2.5 Loss of academic efficiency

This state is generated by low self-esteem, which results in a feeling of inability and insecurity, causing an appreciable decrease in effectiveness in work or study; this in turn creates situations of loss of control (Maslach et al., 2001). According to Pérez-Luño et al. (2000), academic efficacy is lost because there is no intrinsic motivation, generating situations of disinterest, exhaustion and loss of the ability to see the future. This situation is evident in those who studied and worked in pandemic times.

2.6 Technological anxiety or technostress

From the academic perspective, for Hooda & Saini (2017) anxiety is configured in the response to stimuli and stress realities in the academic environment. This is expressed in all students and its presence, intensity and durability is defined by external factors and individual coping abilities (Siddaway et al., 2018). For Duty et al., (2016), the educational problems of college students, including educational dropout, is caused by anxiety. These problems are generated when students are not sufficiently prepared to perform evaluations, develop tasks or assignments, solve exams; and generate a feeling of anguish, despair and worry (Castillo et al., 2021). Ragu-Nathan et al. (2008) mention that technological anxiety or technostress is generated by the helplessness that people have when faced with the use of information technologies. This lack of knowledge may be due to lack of training or disinterest shown by users, so it is necessary to determine what causes these levels of anxiety.
It is understandable that in countries where Internet penetration levels and access speed are low (below the Latin American average), anxiety and concern about access to information and technological resources is manifest.

3. Research model

The research was conducted based on the proposal of Maslach et al. (2001), which establishes that burnout is caused by emotional exhaustion, depersonalization or cynicism and lack of academic effectiveness. These three dimensions have been related to anxiety based on Aedo (2015), as shown in Fig. 1.
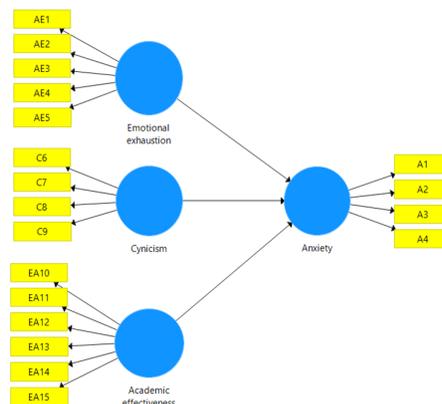

Fig.1. Research model

Based on the research model presented in Figure 1, the following hypotheses are established:

- H1: Emotional exhaustion directly influences the levels of technological anxiety of university students of the FIS - UNCP in times of the Covid19 pandemic.
- H2: Depersonalization or cynicism directly influences the levels of technological anxiety of university students at FIS - UNCP in times of the Covid19 pandemic.
- H3: Lack of academic efficacy directly influences the levels of technological anxiety of university students at FIS - UNCP in times of the Covid19 pandemic.

4. Research methodology

For the study, a population of 328 regular students of the FIS-UNCP, enrolled in the academic period 2021 - II (starting in September and ending in January 2022) and conforming the I to X semester, was approached. The respondents belong to the 2012 and 2017 curricula, which are currently in force. The student population is shown in Table 1.

Table 1
Distribution of students by semester

SEMESTER	I	II	III	IV	V	VI	VII	VIII	IX	X	TOTAL
N	27	36	37	33	26	35	35	30	34	35	**328**
%	8.22%	10.98%	11.28%	10.06%	7.93%	10.67%	10.67%	9.15%	10.37%	10.67%	**100%**

The average student age was 20.2 years. Of the total number of students participating in the research, 256 (78.05% and average age 20.87) were male and 72 (21.95% and average age 20.92) were female. Considering that there is no intervention or modification of the studied reality, but rather it is intended to know the nature of the same; the research has the characteristics of being non-experimental, transectional, with a quali-quantitative approach and a descriptive-explanatory level; in which the academic period 2021-II is taken as the space of study. Use was made of the Maslach Burnout Inventory Questionnaire - Student Survey (MBI-SS) adapted by the Ricardo Palma University (Correa-López et al., 2019), which consists of 15 questions and comprises the dimensions Emotional Exhaustion, Cynicism and Loss of Academic Efficacy, which define the level of stress or academic exhaustion. For the technological anxiety or technostress variable, 4 questions were asked. The questions were closed-ended and comprised Likert-type responses, from Never to Always in a range of seven alternatives. Since the questionnaire was administered virtually, Office Forms was used, the link to which was distributed to the students in the middle of the academic period indicated, the intention and nature of the study was explained to them, ensuring the confidentiality of data and identities, as well as informed consent, in accordance with the provisions of the National Council of Science and Technology (CONCYTEC) and its respective Responsible Conduct in Research (CRI). The average time for responses to the questionnaire was 7 minutes. This information served as the basis for the construction of the data matrix in Microsoft Excel and subsequent processing with SmartPLS v. 3.3.7 by Ringle et al. (2015).

5. Research results

5.1 Descriptive results

Considering that the Likert scale used for data collection considered seven items, these have been scored with the values of 0, 1, 2, 3, 4, 5 and 6 for each of them respectively, making a maximum score less than 0 ($15 \times 0 = 0$) and maximum score greater than 90 ($15 \times 6 = 90$); to then establish cut-off points in thirds according to what is shown in Table 2. This new simplified scale was used to process the information. The levels include the suffering, tendency and absence of burnout in the students evaluated. See Table 3.

Table 2
Scale for the determination of the level of Academic Burnout of students

	Margin
Burnout Suffering	60 - 90
Tendency to Academic Burnout	30 - 59
No concern for Burnout	0 - 29

Table 3
Distribution of students' Academic Burnout suffering

	Frequency	Percentage
Burnout Suffering	26	7.93%
Tendency to Academic Burnout	253	77.13%
No concern for Burnout	49	14.94%
Total	328	100%

The results show that 77.13% of the students evaluated have a tendency to suffer from academic burnout, but do not suffer from it; while in 14.94% of them there is no risk of suffering from academic burnout. Those who suffer from burnout are 26 students representing 7.93% of the population under study. Of this number, 7 are female (26.92%) and 19 are male (73.08%), remaining close to the distribution of the population. Similarly, the average age of those suffering from burnout is 21.19 years, with a maximum age of 28 years corresponding to a student in the 8th semester and a minimum age of 16 years for a student in the 1st semester. In order to identify probable causes for the generation of burnout in these 26 students, a distribution by semester was made, which is shown in Table 4.

Table 4
Distribution by semesters of students suffering from Burnout

Semester	Frequency	Percentage
I	4	15.38%
II	4	15.38%
III	3	11.54%
IV	3	11.54%
V	1	3.85%
VII	1	3.85%
VIII	8	30.76%
IX	2	7.70%
Total	26	100%

From the table above, it can be concluded that about one third of those who suffer from burnout are in the penultimate year of academic training. It is inferred that this situation is generated by the high concentration of subjects taken in the VIII semester, as well as the existing pressure to perform extracurricular activities such as Social Projection and Pre-Professional Practices, which are mandatory and are essential requirements to obtain the Bachelor's Degree. Similarly, it is observed that there is academic burnout in the I and II semester, which is associated with the adaptation and socialization that students are having to university life, and that given the period of pandemic, they have not yet had physical contact with each other, since they entered the university in a state of health emergency; so it is necessary to clarify that the classes are taking place in a virtual environment. On the other hand, the semesters whose students show less presence of burnout are V, VI, VII and X in which the academic loads are balanced; that is to say, the theoretical and practical part maintain a homogeneous distribution, even more so in the X semester the number of subjects is reduced and the realization of pre-professional practices supervised in companies and institutions of the locality is privileged.

5.2 Inferential results based on SmartPLS

5.2.1 Measurement model

According to Hair et al. (2017) the determination of reliability and construct validity is fundamental prior to the study of the model. This assessment is performed through the values of Cronbach's alpha (reliability), composite reliability, convergent and discriminant validity, which are shown in Table 5.

Table 5
Measurement model

Variables	Reliability		Validity Convergent	Discriminant Validity			
	Cronbach's alpha	Composite reliability	Average Variance Extracted	EE	C	AE	A
Emotional exhaustion	0.865	0.916	0.667	**0.817**			
Cynicism or depersonalization	0.816	0.871	0.729	0.811	**0.854**		
Loss of academic efficiency	0.794	0.849	0.773	0.791	0.785	**0.879**	
Technological anxiety	0.818	0.858	0.753	0.809	0.849	0.747	**0.868**

Cronbach's alpha and composite reliability allow establishing the reliability of the measurement model (Nunnally, 1978), given that the value of Cronbach's alpha is greater than 0.79 in all cases, it can be said that there is good internal consistency. On the other hand, according to Nunnally & Bernstein (1994), the coefficients of the composite reliability must be above 0.8, a condition that is also met in the model. Construct validity is determined by convergent validity and discriminant validity. Convergent validity is calculated through the Average Extracted Variance (AVE) which must be greater than 0.50 (Hair et al., 2017). In the case of discriminant validity, the square roots of the corresponding AVEs must be greater than all latent correlations (Fornell & Larcker, 1981). Thus, it has been concluded that the reliability of the individual scale items shown in Table 5 is acceptable.

5.2.2 Analysis of the structural model

For the analysis and validity of the structural model, it is necessary to know the R^2 values, calculation of the beta values corresponding to the relationships established in the model, as well as the t value after bootstrapping, which was composed of 5000 subsamples. Fig. 2 shows the values of the final factor loadings, path values and the R^2 obtained. The results are complemented with the values of Student's t-statistic, as well as the p-value that serve as a basis for the decision or value judgment and acceptance or rejection of the stated hypotheses. See Table 5.
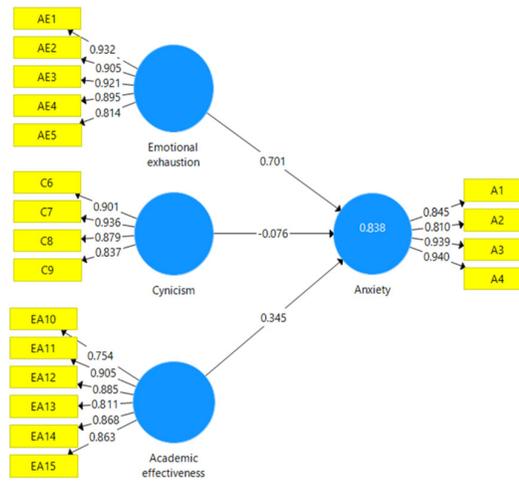
Fig. 2. Confirmatory structural model for anxiety.

Table 5
Results of the structural model analysis

Hypothesis	Simple mean	Standard deviation	Value Path (β)	Student t statistic	p valor	Decision
H1: EE→ A	0.631	0.139	0.701	5.034	0.000	Accepted
H2: C → A	-0.058	0.073	- 0.076	1.041	0.298	No accepted
H3: AE → A	0.395	0.166	0.345	2.076	0.038	Accepted

t > 1.96; p < 0.05

Taking into consideration the results in Table 5, hypothesis 1 and hypothesis 3 (H1 and H3) are accepted, while hypothesis 2 (H2) is rejected. Emotional exhaustion (EE) and lack of academic efficacy (AE) have a positive relationship with technology anxiety (A) in college students, with values β=0.701, p<0.005 and β=0.345, p<0.038 respectively. The value of the coefficient of determination R^2 is 0.838 and suggests a predictive capacity of 83.8% of technological anxiety or technostress in university students through the independent variables considered.

6. Discussion of results

We all suffer from burnout to a greater or lesser extent, Jiaqi et al. (2020) state that this condition of exhaustion has been increased in all people, given that in pandemic times, they have been exposed to the risk of contagion, to the news on television, newspapers, radios and social networks; which led them to states of depression and anxiety above the previously established values. The results obtained in the present research coincide with those of Chávez & Peralta (2019) who identified an inverse relationship between academic stress and students' self-esteem, indicating that, as they advance in their professional training, they manifest high levels of stress in the dimensions considered. On the other hand, and in times of the Covid19 pandemic, Seperak-Viera et al. (2021) recorded that the levels of academic burnout in university students were at a high level of 31.4% and at a very high level of 11.7%, the latter situation being considered at risk. Similarly, they found that the level of academic burnout of women is higher than that of men; also, different levels of burnout were identified among students in different semesters of study; aspects that are interesting to be incorporated into future research. Also, Huyhua et al. (2021) indicate that the high exposure of students to computer screens for the development of their remote work also affects academic stress; therefore, the implementation of new teaching-learning strategies such as the flipped room, active breaks or asynchronous class hours are essential to reduce the levels of depression, anxiety and fatigue. Active and participatory methodologies should respond to the different learning styles detected in each student group in order to increase academic effectiveness (Inga et al., 2020). The results of this research partially coincide with those shown by Arredondo - Hidalgo, M., & Caldera - González, D. (2022) who indicate that students end up having an aversion to the use of information technologies as part of their teaching-learning process, resulting in levels of anxiety and stress. However, this does not happen with the use of social networks, since it is a technological platform with which they are familiar. The results shown coincide with the reality itself in pandemic season, since it explains that university students have felt emotionally exhausted (often depressed, sad and dejected), while the lack of academic efficiency has not been so preponderant since the academic objectives in a virtual environment depend heavily on the capacity for self-management and individual discipline. Cynicism or depersonalization has not been evident, since face-to-face communication and interaction has been replaced by the use of collaborative platforms and videoconferencing that allow students to interact with each other. It is evident that virtual training has affected students' interpersonal relationships, leading them to a certain level of dehumanization and self-isolation.

7. Conclusions

Considering that academic performance is joint, teachers and students must jointly develop pleasant work environments, so the concern for an adequate climate and results is a shared responsibility (León et al., 2021), so the study of the prevalence of burnout syndrome in teachers is essential. Even though in some cases, at the worker level, no direct relationship has been established between the work climate and workload with burnout levels (Robles et al., 2020), it is necessary to consider that teachers at the higher level have also been exposed to the risks inherent to the pandemic, being in many cases people at risk or belonging to the vulnerable population; therefore, the inference that teachers also suffered from technostress is possible. The incorporation of new teaching and learning strategies, oriented to promote the integration and relationship of students, will allow to reduce the degree of academic burnout both at the level of students and teachers, since the solution must have a systemic and not partial connotation. These strategies are collaborative work, asynchronous hours of study and research, active participation, inverted classroom and the role of the reflective teacher rather than the lecturer. Also, these activities will be oriented to reduce the levels of technological anxiety present in teachers and students. These actions should be supported by the General Office of University Welfare, the General Office of Academic Innovation, the Tutoring Coordination and the Department Direction of the faculty, who at the same time should make available to students, teachers and administrative staff activities of mental health, healthy eating, physical exercise, mindfulness, training in digital transformation in the classroom, among others.

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