

## Teaching Technostress and Perception of the Quality of Service in a Private University in Lima

### Tecnoestrés docente y percepción de la calidad de servicio en una universidad privada de Lima

Noel Alcas Zapata 

Universidad César Vallejo, Lima, Perú  
ORCID: <https://orcid.org/0000-0001-9308-4319>

Henry Hugo Alarcón Díaz\* 

Universidad Nacional de Educación Enrique Guzmán y Valle, Lima, Perú  
ORCID: <https://orcid.org/0000-0003-1588-4390>

Carlos Oswaldo Venturo Orbegoso 

Universidad César Vallejo, Lima, Lima, Perú  
ORCID: <https://orcid.org/0000-0002-7465-8687>

Mitchell Alberto Alarcón Díaz 

Universidad César Vallejo, Lima, Lima, Perú  
ORCID: <https://orcid.org/0000-0003-0027-5701>

Juan Antonio Fuentes Esparrell 

Universidad de Granada, Granada, España  
ORCID: <https://orcid.org/0000-0003-4821-7092>

Tatiana Isabel López Echevarría 

Universidad Nacional Federico Villarreal, Lima, Perú  
ORCID: <http://orcid.org/0000-0002-4615-633X>

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#### \*Correspondence

Email: [uapalarcon@hotmail.com](mailto:uapalarcon@hotmail.com)

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## Summary

The objective of this study is to know the association between teaching techno-stress and the perception of the quality of service within a Peruvian university. The psychophysiological disturbances that technological means could be causing when coming into contact with workers are analyzed as part of the impact of new technologies in work spaces. In this sense, a quantitative and non-experimental investigation was carried out in which data were collected through the application of two instruments: the Red Questionnaire (2004) which contains 16 items linked to techno-stress and the ServQual Model with 22 items which measured the perception of the quality of service. Both instruments passed the reliability test through the Cronbach's alpha coefficient, obtaining a value of, 891 and, 911, respectively. Through probabilistic sampling, 154 teachers were considered as samples. For the descriptive and inferential statistical analysis, contingency tables were generated, using the Pearson Chi-Square test statistic, from which it is concluded that there is an association between the teaching Techno-stress and the perception of the quality of service ( $X^2(6) = 85,731$  and the Asymptotic Sig (bilateral) or  $p\_value = 0.000 < 0.05$ ). Likewise, it is concluded that there is an association between the Teaching Techno-stress and the perceptions of each of the theoretical dimensions of service quality: tangible elements ( $X^2(6) = 112,055$  and the Asymptotic Sig (bilateral) or  $p\_value = 0.000 < 0.05$ ), reliability ( $X^2(6) = 63,859$  and the Asymptotic Sig (bilateral) or  $p\_value = 0.000 < 0.05$ ), responsiveness ( $X^2(6) = 35,580$  and the Asymptotic Sig (bilateral) or  $p\_value = 0.000 < 0.05$ ), security ( $X^2(6) = 42,838$  and the Asymptotic Sig (bilateral) or  $p\_value = 0.000 < 0.05$ ) and empathy ( $X^2(6) = 23,633$ , with six degrees of freedom (6) and the Asymptotic Sig (bilateral) or  $p\_value = 0.000 < 0.05$ ).

**Keywords:** Technological Stress, Servqual Model, Information Technologies, Work Environment.

## Resumen

El presente estudio tiene como objetivo conocer la asociación existente entre el tecnoestrés docente y la percepción de la calidad de servicio al interior de una universidad peruana. Las perturbaciones psicofisiológicas que podrían estar provocando los medios tecnológicos al entrar en contacto con los trabajadores son analizadas como parte del impacto de las nuevas tecnologías en los espacios laborales. En tal sentido, se llevó a cabo una investigación cuantitativa y no experimental en la que se recolectaron datos mediante la aplicación de dos instrumentos: el Cuestionario Red (2004) el cual contiene 16 ítems vinculado al tecnoestrés y el Modelo ServQual con 22 ítems el cual midió la percepción de la calidad de servicio. Ambos instrumentos pasaron la prueba de confiabilidad a través del coeficiente de Alfa de Cronbach obteniendo un valor de ,891 y ,911, respectivamente. A través de un muestreo probabilístico se consideró como muestra a 154 docentes. Para el análisis estadístico descriptivo e inferencial, se generaron tablas de contingencia, utilizando el estadístico de prueba Chi-Cuadrado de Pearson, a partir del cual se concluye que existe asociación entre el Tecnoestrés docente y la percepción de la calidad de servicio ( $X^2(6) = 85,731$  y la Sig. Asintótica (bilateral) o  $p\_valor = 0.000 < 0.05$ ). Asimismo, se concluye que existe asociación entre el Tecnoestrés docente y las percepciones de cada de las dimensiones teóricas de la calidad de servicio: elementos tangibles ( $X^2(6) = 112,055$  y la Sig. Asintótica (bilateral) o  $p\_valor = 0.000 < 0.05$ ), fiabilidad ( $X^2(6) = 63,859$  y la Sig. Asintótica (bilateral) o  $p\_valor = 0.000 < 0.05$ ), capacidad de respuesta ( $X^2(6) = 35,580$  y la Sig. Asintótica (bilateral) o  $p\_valor = 0.000 < 0.05$ ), seguridad ( $X^2(6) = 42,838$  y la Sig. Asintótica (bilateral) o  $p\_valor = 0.000 < 0,05$ ) y la empatía ( $X^2(6) = 23,633$ , con seis grados de libertad (6) y la Sig. Asintótica (bilateral) o  $p\_valor = 0,000 < 0,05$ ).

**Palabras clave:** Estrés tecnológico, Modelo ServQual, Tecnologías de la información, Ambiente de trabajo.

## Introduction

The approach to the knowledge of disturbances in people, caused by the use of technologies, is theoretically addressed by Cuervo, Orviz, Arce and Fernández (2017) who affirm that the European Agency for Safety and Health at Work, an institution dedicated to the research of Occupational safety and health, identified a new potential risk caused by the emergence of new technologies that have overflowed into the various work spaces in the world, affecting the family, the workplace and the and company-worker relationship.

From the perspective of technology, sociology, occupational psychology; that is to say, from a panoramic and multidisciplinary point of view, the effects of ICT on workers, the need to adapt quickly to the changing dynamics within institutions, the growing expectation to achieve objectives and increase productivity, the pressure to appropriate increasingly complex intelligent systems, can be considered. All this have made us reflect on techno-stress.

García (2018) states that Hooke, since the 17th century, refers to stress as the exerted pressure which distorts the natural form of a phenomenon. The problems of stress begin with a normal activity which for a time does not cause greater discomfort; the problem arises when that normal activity happens to have contrasts that distort the common life of the person.

For Aragüez (2017), the high exposure to technology due to tasks that require immediacy often exceeds our ability to respond. The anguish that could be generated by not being able to comply with work demands due to technological skills, causes psychological and physiological imbalance. Not being a digital native and having to adapt to new contexts generates the sensation that the media could be winning us a battle.

On the other hand, the incorporation of new technologies in the university space does not necessarily lead to an immediate improvement in educational practices, though it is also true that these technologies have been advancing in the field of higher education.

Studies such as those by Coppari, Bagnoli, Codas, Lopez, Martinez and Montaña (2018), Carlotto, Wendt and Jones (2017), Quintero, Munévar and Munévar (2015), Fuentes, Lorenzo and Ortega (2005), García (2018), Tapasco and Giraldo (2017) reveal the existence of two groups of teachers: those who resist change mediated by technology and those who are open to innovation and systematization of teaching work. Likewise, it is stated that techno-stress, through a series of intervening variables such as skepticism, fatigue, anxiety and inefficiency, could cause continued fatigue due to the need to promote university teaching mediated by technological resources, resulting in the necessary continuous training on the part of the teacher; seeing technology as a complexity and as a form of increasing the work assigned may be a symptom of this.

Specifically in the area of higher education, studies show the improvement of significant learning thanks to the contribution of technology, this leads to a permanent connection between technological resources and teachers; those failures or delays in the tasks to be performed can lead to technological stress.

### Quality of service

Having indicators that show the level of quality of service offered in any institution is a transcendental task since it will be possible to evaluate the processes of continuous improvement to be taken into account in the future.

In this regard, studies by authors such as Arciniegas and Mejias (2017), Larrauri, Espinosa and Robles (2015), Cevallos and Romero (2017) and Sotelo and Leon (2017) affirm that creativity and innovation are part of the daily work at the university, but there are other factors that determine how satisfied the student is: friendly administrative processes, personalized attention,

teaching advice, among others. The quality of a service within these institutions considers objective and subjective aspects. It is a multidimensional view that translates into a global judgment based on the expectations of what is expected to receive and the perception of what is received, and that can be improved. Based on the definition of service quality, which considers the gaps between expectations and perceptions considered by Parasuraman, Zeithaml and Berry (1985) and Alvarado, Morales and Aguayo (2016), this can be considered as the relationship between the service to be received and the service actually provided.

Parra and Rodríguez (2015), Tubay, Peña, Cedeño and Chang (2016), Araya, Escobar, Bertoló, Barrientos (2016) based on theory, state that in a market as competitive as the university market, the quality of service becomes a transversal axis. The different institutional objectives merit an evaluation of quality; the services offered within the university are in the hands of different people and this raises the possibility that some of may make a mistake, thus, heterogeneous behaviors can bring with them an erroneous perception on the part of customers. Diagnosing the state of this quality of service is not a simple process as no reference is being made to a structured product. It is postulated that the quality of service at the university should be considered at a strategic level and that satisfaction should be a kind of indicator for knowing how one is progressing towards excellence. The point of reference is to know the expectations of users as this would allow efficient use of aspects such as time and resources allocated. It is also important to remember that educational organizations impacted by new technologies must adapt to the requirements of users in order to remain in a competitive space.

At present, this situation is really valid, since the perception is that technological means have an enormous impact on workers. Achieving a balance between work and personal matters becomes a challenge that would lead to better individual performance. Thus, in the university where this research was carried out, facts such as the constant and varied use of technological resources, the permanent sending of reports through e-mails, the existing agile communication via social networks, the uncertainty of knowing if the final reports should be complemented or not and the diverse consultations on the part of the users, are the reasons for carrying out this study.

## Method

The study design performed was non-experimental, transverse and correlational. This research was carried out with the purpose of determining the association between teaching techno-stress and the perception of service quality in a private university in Lima. The selection of the sample for this study was random in which 154 teachers participated voluntarily, who provided the information through the survey technique and the application of two questionnaires: one with 16 items to measure the techno-stress variable and the second questionnaire of 22 items with which the perception of the variable quality of service was measured. The techno-stress variable was measured through the adaptation of the Network Questionnaire (2004) considering four dimensions: skepticism (4 items), fatigue (4 items), anxiety (4 items) and ineffectiveness (4 items). Likewise, the variable quality of service was measured with the ServQual Model (2009) and four dimensions were taken into account: tangible elements (4 items), reliability (5 items), response capacity (4 items), security (4 items) and empathy (5 items). The result of the analysis of the internal consistency of the first instrument (Cronbach's alpha = 0.891) and the second instrument (Cronbach's alpha = 0.911) demonstrated their reliability.

Statistical analysis considered data processing, descriptive analysis of results and interpretation. Next, the hypothesis test used Pearson's Chi-Square statistic to determine the association between teacher techno-stress variables and perception of service quality. This process was also carried out between the teacher techno-stress variable and each of the theoretical dimensions of service quality: tangible elements, reliability, responsiveness, security and empathy.

## Results

**Table 1.**

*Contingency table between techno-stress and the perception of service quality*

		Perception of servicio quality		
		Regular	Good	Very good
Techno-stress	Low	18 46.2%	3 4.4%	0 0.0%
	Medium low	19 48.7%	16 23.5%	3 6.4%
	Medium high	2 5.1%	37 54.4%	34 72.3%
	High	0 0.0%	12 17.6%	10 21.3%
Total		39 100,0%	68 100,0%	47 100,0%

Table 1 shows teacher techno-stress at four levels, where 46.2% of teachers with low techno-stress perceive service quality at the regular level, followed by 4.4% at the good level. Also, at the lower medium techno-stress level there are 48.7% of teachers who perceive the quality of service at the regular level, compared to 23.5% at the good level and 6.4% at the very good level respectively. Likewise, at the medium-high techno-stress level, 72.3% of teachers perceive quality of service at the very good level, followed by 54.4% at the good level and 5.1% at the regular level respectively. Finally, in high techno-stress, 21.3% of teachers perceive quality of service at the very good level compared to 17.3% at the good level. The observations in Table 1 indicate the possible association between techno-stress and quality of service.

**Table 2.**

*Chi-square test between teacher techno-stress and the perception of service quality*

Chi-square test	Value	df	Sig. asymptotic (bilateral)
Pearson Chi-square	85,731 <sup>a</sup>	6	.000
Likelihood ratio	96,428	6	.000
Linear association by linear	61,856	1	.000
N of valid cases	154		

a. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 5.32

Table 2 shows the Chi-square statistic calculated from Pearson:  $\chi^2 = 85,731$ , with six degrees of freedom (6) and the Sig. asymptotic (bilateral) or  $p\_value = 0.000 < 0.05$ , which indicates that the variables: teacher stress and perception of service quality are not independent. It is also concluded that teacher techno-stress is associated with the perception of service quality in a private university in Lima.

**Table 3.***Chi-square test between teacher techno-stress and the perception of tangible elements*

Chi-square tests	Value	df	Sig. asymptotic (bilateral)
Pearson Chi-square	112,055 <sup>a</sup>	6	.000
Likelihood ratio	129,045	6	.000
Linear association by linear	86,093	1	.000
N of valid cases	154		

a. 0 cells (0,0%) have expected a count less than 5. The minimum expected count is 6,00.

Table 3 shows the Chi-square statistic calculated from Pearson:  $X^2 = 112,055$ , with six degrees of freedom (6) and the asymptotic sign (bilateral) or  $p\_value = 0,000 < 0,05$ , which indicates that the teaching techno-stress and the perception of tangible elements are not independent. It is also concluded that teacher techno-stress is associated with the perception of tangible elements in a private university in Lima.

**Table 4.***Chi-square test between teacher techno-stress and the perception of reliability*

Chi-square tests	Valor	df	Sig. asymptotic (bilateral)
Pearson Chi-square	63.859 <sup>a</sup>	6	.000
Likelihood ratio	72.195	6	.000
Linear association by linear	39.400	1	.000
N of valid cases	154		

a. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 6.41

Table 4 shows the Chi-square statistic calculated from Pearson:  $X^2 = 63,859$ , with six degrees of freedom (6) and the Sig. asymptotic (bilateral) or  $p\_value = 0.000 < 0.05$ , which indicates that the teacher Techno-stress and the perception of reliability are not independent. It is also concluded that teacher techno-stress is associated with the perception of reliability in a private university in Lima.

**Tabla 5.***Chi-square test between techno-stress and the perception of response capacity*

Chi-square tests	Valor	df	Sig. asintótica (bilateral)
Pearson Chi-square	34.580 <sup>a</sup>	6	.000
Likelihood ratio	37.703	6	.000
Linear association by linear	25.487	1	.000
N of valid cases	154		

a. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 6.55

Table 5 shows the Chi-square statistic calculated from Pearson:  $X^2 = 35,580$ , with six degrees of freedom (6) and the asymptotic sign (bilateral) or  $p\_value = 0,000 < 0,05$ , which indicates that the teacher Techno-stress and the perception of response capacity are not independent. In addition, it is concluded that teacher techno-stress is associated with the perception of response capacity in a private university in Lima.

**Tabla 6.***Chi-square test between techno-stress and the perception of security*

Chi-square tests	Valor	df	Sig. asintótica (bilateral)
Pearson Chi-square	42.838 <sup>a</sup>	6	.000
Likelihood ratio	41.423	6	.000
Linear association by linear	18.617	1	.000
N of valid cases	154		

a. 2 cells (16.7%) have expected a count less than 5. The minimum expected count is 3.68

Table 6 shows the Chi-square statistic calculated from Pearson:  $X^2 = 42,838$ , with six degrees of freedom (6) and the Sig. asymptotic (bilateral) or  $p\_value = 0,000 < 0,05$ , which indicates that the teacher techno-stress and the perception of security, are not independent. It is also concluded that teacher techno-stress is associated with the perception of security in a private university in Lima.

**Tabla 7.***Chi-square test between techno-stress and the perception of empathy*

Chi-square tests	Valor	df	Sig. asintótica (bilateral)
Pearson Chi-square	26.633 <sup>a</sup>	6	.000
Likelihood ratio	27.464	6	.000
Linear association by linear	12.661	1	.000
N of valid cases	154		

a. 1 cell (8.3%) have expected a count less than 5. The minimum expected count is 4.77

Table 7 shows the Chi-square statistic calculated from Pearson:  $X^2 = 23,633$ , with six degrees of freedom (6) and the asymptotic sig. (bilateral) or  $p\_value = 0.000 < 0.05$ , which indicates that the teacher's Techno-stress and the perception of empathy are not independent. It is also concluded that teacher techno stress is associated with the perception of empathy in a private university in Lima.

## Discussion

The results obtained show the association of teaching techno-stress with the perception of the quality of the service and with the dimensions: tangible elements, reliability, responsiveness, security and empathy. In this regard, Tapasco and Giraldo (2017) and Palacios, Felix and Ormazá (2016) comment that the technological revolution has produced changes at a global level; companies need human resources to adopt changes quickly, staff must be trained for these new teaching and learning systems which leads to greater efficiency; therefore organizations present a dynamic changing continuously. It is a new form of industrial revolution expressed in the handling of e-mails, social networks linked to the work environment, specialized software, specialized institutional platforms, and so on. In this context, techno-stress has become popular among pathologies linked to daily work in the form of a negative technological adaptation generated in the person. For their part, Sotelo and Leon (2017) recognize the existence of multiple dimensions and indicators to diagnose the quality of the service offered. At present in the university, how one learns, how one investigates, how one organizes, how one evaluates, etc. is influenced in part by the intervention of new technologies.

Quintero, Munévar and Munévar (2015), Prieto and Hernandez (2014) and Correia and Miranda (2012) reflect on techno-stress when they state that providing a response in time implies that the person is in a state of hyper-alert i.e. hyper-connected at all times; this state generates in the subject the capacity to receive an enormous amount of stimuli simultaneously. This leads us to reinforce the idea of the precaution of the permanent link between subjects and digital media.

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