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Mexican College Teacher's Job Satisfaction During the Covid-19 Pandemic Represented Through a Technostress Matrix

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The Covid-19 pandemic that swept through higher education institutions between 2020-2021 forced a number of different changes in Mexican university teachers. A digital survey with an ad hoc technostress scale was responded by 176 Mexican higher education teachers to measure their perceived technostress levels. The quantitative results were then used to create a simple classification matrix were the teachers were categorically divided in four different groups so as to identify which group was the most and least technostressed as well as most and least satisfied with their jobs.

Keywords: Digital survey, technostress, quantitative analysis.

1. Introduction

Technostress was originally defined by Brod [9] as "a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner" (p. 16), yet no research to date has focused on the work satisfaction of Mexican university teachers in relation to their measured level of technostress.

A considerable amount of academic literature on the subject was published during the Covid-19 pandemic, including teacher's technostress. For example, Panisoara [36] found that those educators with the highest internal motivation levels were more likely to continue remote teaching during the Covid-19 pandemic. A group of Chilean educators was analyzed by Estrada-Muñoz *et al.* [17] and noted male teachers suffered more techno-anxiety and techno-fatigue than their female counterparts. In Spain, García-González *et al.* [20, 21] found that teachers developed several different psychological afflictions due to the repetitive nature of remote teaching activities during the pandemic; women educators were the most negatively affected at the emotional level because of these mental issues. Bauwens *et al.* [4] noticed that digital environments fostered by intense use of academic ICTs negatively impacted teacher's work-life balance, either due to school culture or contextual reasons that regularly stepped over the boundaries of their private lives. Sokal *et al.* [42] found that teacher burnout and resiliency are linked to attitude towards change, efficacy and perceived organizational support. Boyer-Davis [8] established college teacher's technostress levels increased during the pandemic thanks to a questionnaire applied before and during Covid-19 times that included an *ad hoc* technostress scale. The effects on university teacher's work due to computer-mediated classes via videoconference software was studied by Casacchia *et al.* [12], who found female educators where the most emotionally strained by the lack of visual face-face communication as practiced in a classroom. Academician's digital fatigue was studied by Bonanomi *et al.* [7], wherein those who presented the highest levels showed unhealthy habits, psychosomatic problems, diminished mental health and more Covid-19 related health. On the other hand, Solis et al. [43] measured low technostress levels among Spanish teachers during the Covid-19 confinement, but older educators felt inefficient and skeptical with respect to the technological change brought upon the pandemic. Related to this study is Penado *et al.* [37], whom also found that older teachers with higher institutional status felt more technostress during the forced

migration to online classes. Fernández-Batanero *et al*. [24] focused on the effects of ICT use by teachers. Bencsik & Csinger [5] found that technostress negatively affected education worker's lives because it frequently interfered with their private lives and rapid and constant technological change required from them cognitive resources to learn how to adequately use them.

Asian and Middle Eastern researchers also published several different studies related to teacher's technostress during this period. Wang & Yao [46] determined Chinese teachers felt less dissatisfied with their jobs and less technostressed when they searched for help with the Information Systems experts at their schools. Chou & Chou [14] found that Taiwanese teacher's willingness to adapt to online courses during the pandemic could be attributed to categorical differences within the educators and their tolerance to technostressors like invasion of privacy and a higher sense of self-efficacy. Yang & Juyong [47] analyzed Korean teacher's technostress levels and stated that techno-complexity was the main cause of negative mood changes within their studied group. In Iran, Ghasemi *et al*. [22] showed the teaching changes forced by the pandemic instilled several problems within university educators, including anxiety and insomnia, especially in female teachers. Egyptian teachers were studied by Gabr *et al*. [19] who found that female educators were the most technostressed as well a tenured professor. Saleem *et al*. [40] studied university teacher's technostress levels in Pakistan. Cahapay & Bangoc [10] established that higher technostress levels had a clear negative impact on the work performance of Filipino university teachers. Finally, the impact of technostress on Latin American teachers was also studied during this period. Urbano *et al*. [45] noted female Colombian educators were more likely to suffer from technostress anxiety related to ICT use during Covid-19 lock-downs. A longitudinal study by Lizana *et al*. [28] evidenced that Chilean female teacher's perceived quality of life level dropped more than their male counterparts during the pandemic due to an increase in school related remote work, loneliness and isolation.

Previously, Blanch [6] had analyzed different work-related, social, and economic implications of ICT use by teachers and noted that information overload would be almost inevitable for these knowledge workers given the rapid advance of technology in the Education field. Syvänen *et al*. [44] found that teachers with temporary jobs suffer higher technostress levels than those with contractual security. Joo *et al*. [27], meanwhile, established that higher technostress levels predict less use of intention of ICT classroom tools. Çoklar *et al*. [15] found that educators with higher degrees of technostress have lower psychological capital, which in turn diminished their sense of optimism, hope and auto-efficacy. Moreira-Fontán *et al*. [31] studied teacher's attitude towards ICTs and noticed it largely determines their work commitment. Goebel & Carlotto [23] studied burnout predictors in Brazil in a group of computer-based distance educators and found the most important prediction variable in the "work" construct was technostress/incredulity. Before the Covid-19 pandemic, Özgür [35] noted teachers with school support and a combination of pedagogical and technological skills had presented less technostress when compared to those who didn't have these characteristics. Califf & Brooks [11] found that younger educators suffer higher negative technostress levels related to ICT use when compared to more experienced educators, who also declared being technostressed, but the latter group indicated a lower intention to change jobs.

Mexico has produced a handful of academic literature on technostress and even fewer on teacher's technostress. Ruiz *et al*. [39] showed that anxiety related to ICT use was the main cause of technostress within a particular group of educators in central Mexico. Another study by Domínguez-Torres *et al*. [16] noted that during the Covid-19 lock-downs technological overload, work intensity, techno-invasion and the consequences of working outside normal office hours were the main predictors of teachers technostress.

Having summarized the most salient academic literature on teacher's technostress it follows then that there exists a notable opportunity to expand on this area of study in Latin American in general and Mexico in particular. This study proposes a quantitative approach to measure Mexican university teacher's technostress levels in relation to their work-related satisfaction. We consider this subject relevant to Mexico's society in view of its accelerated technological change since the Covid-19 pandemic. Given that higher education plays an important role in developing countries like Mexico, educator satisfaction should be considered a relevant area of study for public and private universities. Even after the Covid-19 confinements, some of the educational practices initiated during this period remain, most notably remote teaching through a videoconference service. This study aims to mark a baseline point of teacher's technostress supported on the results gathered during the most stringent moments of the Covid-19 lockdown so as to have a reference point for future teacher's technostress studies.

2. Method

A 40-item digital questionnaire uploaded to Survey Monkey was sent to a group of 100 university teachers who were asked to resend the link to their colleagues between 10/18/2020 and 12/31/2020. The questionnaire was also promoted via Facebook. The instrument included four filter questions to eliminate any possible respondents who did not teach in a university located in Mexico City or the selected 43 municipalities of the State of Mexico bordering or very near the country's capital, did not work with ICT tools for educational purposes, and said that their teaching job produced less stress than other daily activities (this filter intended to eliminate teachers who felt withdrawn or too distant from their education jobs for reasons not relevant to the current questionnaire). The last filter question asked the respondents for the name of the higher education institution they taught. Any answers left in blank or answers that included institutions outside the specific geographical area mentioned were not considered for data analysis. Sampling methodology was non-parametric. A total of 53 higher education institutions of the selected geographical area were included in the final results, where 46 of them were private and 7 public.

Within the 40-item questionnaire a 12 question *ad hoc* teacher's technostress scale was included (Table 2). This scale was based on the work by Cazares [13] who adapted two technostress scales for general Mexican populations. A portion of Cazares [13] final instrument was modified so that questions would be relevant for Mexican university teachers. The scale was tested two times, once in April 2019 with 50 university educators and the second in April 2020 with 75 university educators. Questions were modified for clarity after receiving their feedback. Each one of the 12 items was measured on a 5-item Likert frequency scale with responses ranging from "never" to "always". Immediately after the 12-item scale the educators were asked about their overall teaching satisfaction by selecting if they agreed or disagreed with a global statement of their education jobs.

Internal consistency of the 12-item scale was good with a standardized Cronbach's Alpha of 0.835. The total corrected correlation of elements for all items remained inside the 0.300 and 0.700 range, indicating reliability. According to Ferketich [18], values under 0.300 suggest a weak correlation, while values above 0.700 imply repetitiveness.

Each of the 176 completed questionnaires were later organized with the intention of ranking teachers with the highest level of technostress. To do this, responses from the 12-item scale were codified with a numerical value ranging from 1 (never) to 5 (always) were the higher number represented a higher degree of technostress according to the questionnaire. A mathematical mean of 36.8 points was obtained from the 176 respondents (min. 12 points, max. 60 points). Afterwards, the sum of the scale scores for each educator were crossed with the "satisfied" and "dissatisfied" categories to organize the teachers in four distinct groups according to their rank in relation to the mathematical mean. This allowed us to design a teachers technostress matrix.

3. Results

Sex	Male	Female		
	44.9%	55.1%		
Age (average)	45.9 years (min. 25, max. 79, mode 55. S.D. 10.35)			
Marital status	Bachelor	Married	Widow	
	47.2%	50.6%	2.2%	
Higher education degree	Bachelor	Masters	PhD	Postdoc
	10.8%	53.4%	30.7%	5.1%
Contract type	Visiting	Tenured	Semi-tenured	
	60.8%	27.3%	11.8%	

Number of universities teaching at	1	2	3	4 or more
	55.7%	31.3%	9.7%	3.3%
Years of teaching experience (average)	17.11 (min 2, max 60, mode 10, S.D. 10.83)			
Weekly class hours (average)	16 (min 2, max 60, mode 12, S.D. 10.34)			
Has another job besides teaching	Yes	No		
	70.5%	29.5%		
Percentage of total annual salary obtained from teaching activities	62%			
Number of ICT education tools used regularly (average)	5.1 (min 1, max 16, mode 4, S.D. 2.9)			
Average daily use of internet for teaching job (hours)	9.3 (min 1, max 18, mode 10, S.D. 3.6)			
Number of weekly digital messages interchanged with students	70.5 (min 10, max 300, mode 10, S.D. 67.4)			
Number of weekly messages interchanged with academic superior	51.7 (min 10, max 300, mode 10, S.D. 62.9)			
Percentage of teachers who say their academic work increased because of the Covid-19 pandemic	93.6%			

Table 1. Sociodemographic and other relevant information of the studied sample (n = 176)

		Frequency					**Total**	**Mean**
		Never	Almost never	Sometimes	Almost always	Always		
1	**With what frequency do you find it difficult to work with digital technologies?**	6.3%	21.6%	64.8%	5.1%	2.3%	100%	2.76 (S.D. 0.74)
2	**With what frequency do you feel bad if you can not access digital technologies?**	5.7%	13.6%	43.2%	25%	12.5%	100%	3.25 (S.D. 1.03)
3	**With what frequency does working with digital technologies makes you feel uncomfortable, irritable and impatient?**	4%	13.1%	63.1%	15.3%	4.5%	100%	3.03 (S.D. 1.03)
4	**With what frequency do you feel a physical indisposition such as headaches, nervous**	5.7%	21%	44.9%	22.2%	6.3%	100%	3.02

	bowels, eye twitching, for example, when working with ICT academic tools?							(S.D. 0.96)
5	**With what frequency do you feel a physical indisposition such as headaches, nervous bowels, eye twitching, for example, when using your mobile phone to answer an urgent academic message?**	8%	25.6%	42%	18.8%	5.7%	100%	2.89 (S.D. 0.99)
6	**With what frequency do you find it difficult to concentrate after working with digital technologies?**	3.4%	18.8%	46%	23.9%	8%	100%	3.14 (S.D. 0.93)
7	**With what frequency do you find it difficult to do various teaching activities at the same time using one or more digital technologies? (multitasking)**	3.4%	13.1%	44.9%	29%	9.7%	100%	3.28 (S.D. 0.93)
8	**With what frequency do you find it difficult to relax after a day's work with digital technologies?**	3.4%	11.4%	35.8%	34.7%	14.8%	100%	3.46 (S.D. 0.99)
9	**With what frequency do you feel an internal impulse that compels you to use digital technologies anytime and everywhere?**	4%	13.1%	34.1%	36.9%	11.9%	100%	3.40 (S.D. 0.99)
10	**With what frequency do you feel digital technologies control o determine your behavior?**	6.8%	21.6%	39.8%	23.3%	8.5%	100%	3.05 (S.D. 1.03)
11	**With what frequency do you feel digital technologies make it difficult for you to achieve your teaching goals?**	6.8%	32.4%	39.2%	17%	4.5%	100%	2.8 (S.D. 0.96)
12	**With what frequency do you find it difficult to adapt to the demands of a new digital technology required for your teaching job?**	6.3%	27.3%	50%	14.8%	1.7%	100%	2.78 (S.D. 0.83)

Table 2. Results from university teacher's technostress scale (n = 176)

	Agree	Disagree

Do you agree or disagree with the following statement? "In general, I'm satisfied with my teaching job when I consider my salary, relationship and communication with my students and academic superiors, as well as the digital technologies I use at it?	59%	41%

Table 3. Overall satisfaction with teaching job (n = 176)

4. Discussion

As shown in Table 1, 60% of the sampled educators worked under a visiting professor contract, a statistic that somewhat resembled the contractual conditions of most university teachers in Mexico according to large scale education surveys (72% as stated by SIIES [45]; 68.5% as reported by ANUIES [1]). Also of note is the average of 9.3 daily hours of dedicated internet use the sampled group said they allowed for their teaching job. This average was slightly higher than the average daily time of 8 hours and 57 minutes most Mexicans passed on the internet, where 4 hours are dedicated to social media [2]. During the confinement period 93% of the surveyed teachers said their academic work increased because of the Covid-19 pandemic, a logical conclusion to the two variables mentioned above, in addition to other numerical indicators of Table 1.

Regarding Table 2, notable answers include item 2 of the teacher's technostress scale, where more than a third of respondents (37.5%) said they almost always or always feel bad if they can't access their digital technologies. Also of note is item 6, given that 31.9% of teacher's stated they almost always or always find it difficult to concentrate after working with digital technologies. Item 8 suggests this difficulty to concentrate is also linked to the difficulty the sampled group said they must relax after a day's work with digital technologies: practically half of all educators (49.5%) said they suffered this condition almost always or always. More to the point, many of the surveyed teachers (48.8%) affirmed an internal impulse compels them to use digital technologies anytime and everywhere almost always or always, as shown in item 9. Coincidentally, as per item 10, almost a third of those surveyed (31.8%) indicated technologies control to determine their behavior almost or almost always.

Having said that, Table 3 shows the categorical division of those sampled teachers who were asked to classify themselves as generally satisfied with their teaching job. Most the educators (59%) said they agreed with the satisfaction statement. The remaining 41%, it is inferred, can be said to be dissatisfied with their teaching positions.

It should be noted our questionnaire was launched during some of the worst months of the confinement period of the pandemic, that is, from the middle of October to the end December of 2020. We are very aware of the bias this situation could have of the questionnaire results. However, even if the data is skewed towards the more pernicious effects the pandemic had on the surveyed teachers, the unprecedented sanitary situation, combined with the particularities of the educators noted on Table 1, that is, little to no contractual certainty in most of the cases, given their untenured position, as well as increased teaching load mediated through a digital device. These fundamental conditions, plus the stringent economic realities brought upon by the obligatory government confinements in the education sector, produced an environment that fostered a high degree of technostress among the surveyed group. During this period, the term "Zoom fatigue" was popularized within educators [3]. This constant sensory overload of student and administrative demands, multiple ICTs operating within the digital environment of the teacher, plus everyday domestic activities

may have altered teacher's habitual threshold to technostress, or at the very least to the technological and social conditions that mediate between a potential situation that could produce technostress.

The descriptive statistics presented above were used to classify teachers in four distinct groups according to their results in the 12-item technostress scale of Table 3. It should be made clear that these four groups were assembled by using the mathematical mean of 36.8 points obtained from the 176 completed questionnaires as the defining mark for categorical differentiation among them.

Employe satisfaction matrixes can be useful for organizations since long term commitment worker can be related to this variable [38, 32]. More recent employe satisfaction studies have found a strong link between worker satisfaction and organizational performance [30, 34, 26, 29, 33, 25]. It is within this theoretical framework we developed our own teachers technostress matrix, given the complex interpendency of various web-based technological advancements materialized in ICTs that impact higher-education Mexican institutions.

- Group 1. Iconodulic evangelist. Satisfied with high technostress (more than or equal to 36.8 points on the 12-item technostress scale). This group comprised 27.2% of all respondents. Defining characteristics of this group: mostly women (60% of those that fell inside this category); higher average age and teaching experience than the sample (46.9 vs. 45.9 years; 18.4 vs. 17.1 years); work less hours per week than the group average (13.9 vs. 16 hours); have a second job besides teaching with less frequency than the group average (66% vs 70.5%). This group said that digital technologies control their behaviors with more frequency than the rest of the sample (3.58 vs. 3 points on the 5-point technostress scale).

- Group 2. Selfless soldier. Satisfied with low technostress (less than 36.8 points on the 12-item technostress scale). This group comprised 31.8% of all respondents, the largest of the four groups in the matrix. Mostly married (66% vs 50% of the entire sample); work with fewer ICT education tools (4.8 vs. 5.1); less average daily use of internet for teaching job (8.9 vs. 9.3 hours); fewer number of weekly messages interchanged with students and academic superiors (51.7 vs. 70.5; 37 vs. 59); presents less average frequency in practically all of the 12-items of the technostress scale when compared to the mathematical mean of said items, meaning less perceived technostress.

- Group 3. Inquisitive mercenary. Dissatisfied with high technostress (more than or equal to 36.8 points on the 12-item technostress scale). This group comprised 23.8% of all respondents. Generally, has a lower education level than the group. Higher than average frequency of visiting professor contractual situation (66.7% vs. 60% of the sample group). Works at more universities (1.69 vs. 1.61). Has less teaching experience in general (15.8 vs 17.1 years of the sample group). Works more hours on the internet than the average (9.8 vs. 9.3 hours). Higher frequency of second job besides teaching (78% vs. 70.5%). Presents more average frequency in practically all the 12-items of the technostress scale when compared to the mathematical mean of said items, meaning more perceived technostress.

- Group 4. Iconoclastic heretic. Dissatisfied with low technostress (less than 36.8 points on the 12-item technostress scale). This group comprised 17.1% of all respondents. Generally single male teachers (56% of this subgroup) with a slightly below average age than the studies sample (44.9 vs. 45.9 years). Work with a larger amount of education ICT tools (5.7 vs the average of 5.1). Feels bad when unable to access digital technologies with less frequency than the sample (2.80 vs. 3.25 points). Academic ICTs tools cause physical indisposition with less frequency than the sample average (2.4 vs. 3 points).

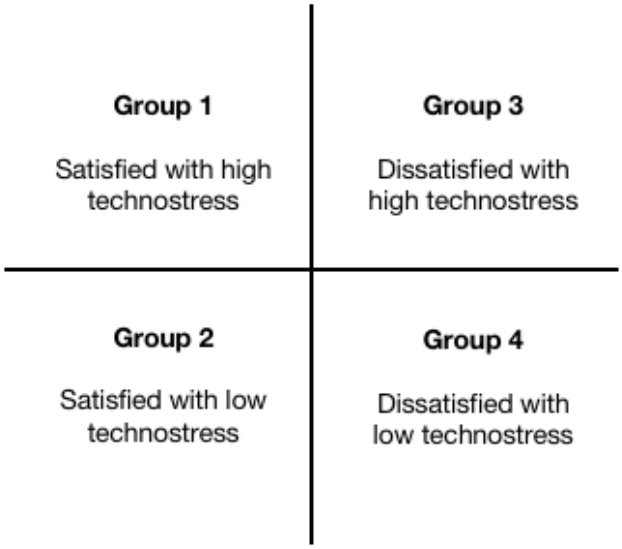

Figure 1. Teachers technostress matrix

5. Conclusion

Teacher's technostress in Mexico has garnered little academic interest. The results presented in this text suggest the Covid-19 pandemic had a notable impact on the costumes of university educators that may need to be studied more profoundly now that the pandemic restrictions have subsided. Having said that, the data presented here allows for a benchmark of higher-education teacher's technostress, that, even if it's circumscribed to a particular moment and geography allows for subsequent post-pandemic studies. As was shown, the largest group of teachers were categorized in the "selfless soldier" typology. That doesn't mean, however, other external shocks to higher education teaching practices (another pandemic or a severe cultural shift, just to name a few) could tilt educators more to the two dissatisfied categories we presented in our matrix. University administrators should take note of these results to plan and strategize over possible scenarios that could affect their institutions in case teachers are forced to completely modify their education practices once again.

References

[1] **Asociación Nacional de Universidades e Instituciones de Educación Superior** (ANUIES). (2021). *Anuario Educación Superior – Técnico Superior, Licenciatura y Posgrado V.1.1*. ANUIES.

[2] **Asociación de Internet MX**. (2021). *º16 Estudio sobre los Hábitos de los Usuarios de Internet en México 2020*. *Asociación de Internet MX*.

[3] **Bailenson, J. N.** (2021). Nonverbal overload: A theoretical argument for the causes of Zoom fatigue. *Technology, Mind, and Behavior*, *2*(1), 1-6.

[4] **Bauwens, R., Muylaert, J., Clarysse, E., Audenaert, M., & Decramer, A.** (2020). Teachers' acceptance and use of digital learning environments after hours: Implications for work-life balance and the role of integration preference. *Computers in Human Behavior*, *112*(November 2020), e106479.

[5] **Bencsik, A., & Csinger, B.** (2021). Innovations in human resources management of higher education institutions: Technostress factors. *Marketing and Management of Innovations*, *4*(2021), 55-67.

[6] **Blanch, J**. (2013). El trabajo académico digital como factor de riesgo psicosocial: usos y abusos de las tic en la educación superior. *Educação em Perspectiva*, *4*(2), 511-532.

[7] **Bonanomi, A., Facchin, F., Barello, S., & Villani, D.** (2021). Prevalence and health correlates of online fatigue: A cross-sectional study on the Italian academic community during the COVID-19 pandemic. *PLOS ONE*, *16*(10), e0255181.

[8] **Boyer-Davis, S.** (2020). Technostress in higher education: An examination of faculty perceptions before and during the covid-19 pandemic. *Journal of Business and Accounting*, *13*(1), 42-58.

[9] **Brod, C.** (1984). *Technostress. The Human Cost Of The Computer Revolution*. Basic Books.

[10] **Cahapay, M., & Bangoc II, F.** (2021). Technostress, work performance, job satisfaction, and career commitment of teachers amid covid-19 crisis in the Philippines. *IJERI: International Journal of Educational Research and Innovation*, *n/v*(16), 260–275.

[11] **Califf, C.B., & Brooks, S.** (2020). An empirical study of techno-stressors, literacy facilitation, burnout, and turnover intention as experienced by K-12 teachers. *Computers & Education*, *157*(November 2020), e103971.

[12] **Casacchia, M., Cifone, M. G., Giusti, L., Fabiani, L., Gatto, R., Lancia, L., Cinque, B., Petrucci, C., Giannoni, M., Ippoliti, R., Frattaroli, A. R., Macchiarelli, G., & Roncone, R.** (2021). Distance education during COVID 19: An Italian survey on the University Teachers' perspectives and their emotional conditions. *BMC Medical Education*, *21*(335), 1–17.

[13] **Cazares, M.A.** (2019). *Adaptación de Dos Escalas para Medir Tecnoestrés y Tecnoadicción en una Población Laboral Mexicana*. UNAM [thesis]

[14] **Chou, H., & Chou, C.** (2021). A multigroup analysis of factors underlying teachers' technostress and their continuance intention toward online teaching. *Computers & Education*, *175*(2021), e104335.

[15] **Çoklar, A.N., Eíltí, E., & Sahín, Y.L.** (2017). Defining teachers' technostress levels: A scale development. *Journal of Education and Practice*, *8*(21), 28-41.

[16] **Domínguez-Torres, L., Rodríguez-Vásquez, D., Totolhua-Reyes, B., & Rojas-Solís, J.** (2021). Tecnoestrés en docentes de educación media superior en el contexto de confinamiento por COVID-19: Un estudio exploratorio. *Revista Dilemas Contemporáneos: Educación, Política y Valores, 43*(9), n/p.

[17] **Estrada-Muñoz, C., Castillo, D., Vega-Muñoz, A., & Boada-Grau, J.** (2020). Teacher technostress in the Chilean school system. *International Journal of Environmental Research and Public Health*, *17*(15),e5280.

[18] **Ferketich, S.** (1991). Focus on psychometrics. Aspectos of item analysis. *Research in Nursing and Health*, *14*(2), 165-168.

[19] **Gabr, H., Soliman, S., Allam, H., & Raouf, S.** (2021). Effects of remote virtual work environment during COVID-19 pandemic on technostress among Menoufia University staff, Egypt: A cross-sectional study. *Environmental Science and Pollution Research*, *28*(38), 53746–53753.

[20] **García-González, M., Torrano, F., & García-González, G.** (2020a). Estudio de los factores de riesgo psicosocial en profesoras de universidades online: Una mirada desde adentro. Interdisciplinaria. *Revista de Psicología y Ciencias Afines*, *37*(1), 293-312.

[21] **García-González, M., Torrano, F., & García-González, G.** (2020b). Analysis of stress factors for female professors at online universities. *International Journal of Environmental Research and Public Health*, *17*(8), e2958.

[22] **Ghasemi, F., Zarei, Heidarimoghadam, R. & Hosseini, S.M.** (2021). Exploring unprecedented problems of academicians during the COVID 19 pandemic and their relationships with fatigue and mental health. *Gene Reports*, *23*(2021), e101098.

[23] **Goebel, D.K., & Carlotto, M.S.** (2019). Preditores sociodemográficos, laborais e psicossociais da Síndrome de Burnout em docentes de educação a distância. *Avances en Psicología Latinoamericana*, *37*(2), 295-311.

[24] **Fernández-Batanero, J.M., Román-Graván, P., Reyes-Rebollo, M., & Montenegro-Rueda, M.** (2021). Impact of educational technology on teacher stress and anxiety: A literature review. *International Journal of Environmental Research and Public Health*, *17*(15), e5280.

[25] **Inayat, W., & Khan, M.J.** (2021). A study of job satisfaction and its effect on the performance of employees working in private sector organizations, Peshawar. *Education Research International*, 21(2021), e1751495, 1-9.

[26] **Ismail, A., & Abd Razak, M.R.** (2016). Effect of job satisfaction or organizational commitment. *Management & Marketing*, 14(1), 26-40.

[27] **Joo, Y.J., Lim, K.Y., & Kim, N.H.** (2016). The effects of secondary teachers' technostress on the intention to use technology in South Korea. *Computers & Education*, *95*(April 2016), 144-122.

[28] **Lizana, P., Vega-Fernadez, G., Gomez-Bruton, A., Leyton, B., & Lera, L.** (2021). Impact of the COVID 19 pandemic on teacher quality of life: A longitudinal study from before and during the health crisis. *International Journal of Environmental Research and Public Health*, *18*(7), e3764.

[29] **Miah, M.** (2018). The impact of employee job satisfaction toward organizational performance: A study of private sector employees in Kuching, East Malaysia. *International Journal of Scientific and Research Publications*, 8(12), 270-278.

[30] **Mohammed, F., & Eleswed, M.** (2013). Job satisfaction and organizational commitment: A correlational study in Bahrain. *International Journal of Business, Humanities and Technology*, 3(5), 43-53.

[31] **Moreira-Fontán, E., García-Señorán, M., Conde-Rodríguez, A., & González, A.** (2019). Teachers' ICT- related self-efficacy, job resources, and positive emotions: Their structural relations with autonomous motivation and work engagement. *Computers & Education*, *134*(June 2019), 63-77.

[32] **Mowday, R.T., Steers, R.M., & Porter, L.W.** (1979). The measure of organizational commitment. *Journal of Vocational Behavior*, 14(1979), 224-247.

[33] **Onyebuchi, O., Lucky, O., & Omah, O.** (2019). Impact of employee job satisfaction on organizational performance. *International Journal of Current Research*, 6(12), 6-12.

[34] **Ouedraogo, A., & Leclerc, A.** (2013). Job satisfaction and organizational performance: Evidence from Canadian credit union. *Journal of Organizational Culture, Communications and Conflict*, 17(1), 35-50.

[35] **Özgür, H.** (2020). Relationships between teachers' technostress, technological pedagogical content knowledge (TPACK), school support and demographic variables: A structural equation modeling *Computers in Human Behavior*, *112*(November 2020), e106468.

[36] **Panisoara, I.O., Lazar, I., Panisoara, G., Chirca, R., & Ursu, A.S.** (2020). Motivation and continuance intention towards online instruction among teachers during the COVID-19 pandemic: The mediating effect of burnout and technostress. *International Journal of Environmental Research and Public Health*, *12*(21), e8002.

[37] **Penado, M., Rodicio-García, M., Ríos-de Deus, M., & Mosquera-González, M.** (2021). Technostress in Spanish university teachers during the COVID-19 pandemic. *Frontiers in Psychology*, *12*(2021), e617650.

[38] **Porter, L. W., Steers, R. M., Mowday, R. T., & Boulian, P. V.** (1974). Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of Applied Psychology*, 59(5), 603-609.

[39] **Ruiz, V., Ríos-Manríquez, M., & Sánchez-Fernández, M., D.** (2019). Los tecno recursos laborales y su impacto en el tecnoestrés. Un caso empírico. *International Journal of Innovation*, *7*(2), 299-311.

[40] **Saleem, F., Malik, M., Qureshi, S., Farid, M., & Qamar, S.** (2021). Technostress and employee performance Nexus during COVID-19: Training and creative self-efficacy as moderators. *Frontiers in Psychology*, *12*(2021), e595119.

[41] **Sistema Integrado de Información de la Educación Superior** (SIIES). (2020). Estadísticas sobre la Educación Superior en México. Personal Académico.

[42] **Sokal, L., Trudel, L.E., & Babb, J.** (2020). Canadian teachers' attitudes toward change, efficacy, and burnout during the Covid-19 pandemic. *International Journal of Educational Research Open*, *1*(2020), e100016.

[43] **Solís García, P., Lago Urbano, R., & Real Castelao, S.** (2021). Consequences of Covid-19 confinement for teachers: Family-work interactions, technostress, and perceived organizational support. *International Journal of Environmental Research and Public Health*, *18*(21), e11259.

[44] **Syvänen, A., Mäkiniemi, J.P., Syrjä, S., Heikkilä, K. & Viteli, J.** (2016). When does the educational use of ICT become a source of technostress for Finish teachers?. *International Journal of Media, Technology and Lifelong Learning*, *12*(2), 96-109.

[45] **Urbano O., Chanchí G., & Campo M.** (2021). Technostress analysis in educational institutions during the COVID-19 confinement. *TEM Journal*, *10*(4), 1655–1661.

[46] **Wang, Q., & Yao, N.** (2021). The impact of technostress creators on novice teachers' job satisfaction. *Journal of Education for Teaching International research and pedagogy,* n/v(n/n), n/p.

[47] **Yang, Y., & Juyong, L.** (2021). Impacts of early childhood teachers' techno-stress and happiness on technology, pedagogy, and content knowledge. *Korean Journal of Early Childhood Education*, *41*(6), 83-105