UNIVERSIDAD NACIONAL DE SAN AGUSTÍN DE AREQUIPA

FACULTAD DE CIENCIAS DE LA EDUCACIÓN

ESCUELA PROFESIONAL DE EDUCACIÓN

TECHNOSTRESS IN THE FREQUENCY OF USE OF ICT

Tesis formato Artículo presentado por:

Yudit Yessica, CHOQQUE CABRERA

Mayra Janet, MALAGA VILLALBA

Para optar el Título Profesional de: Licenciadas en Educación, especialidad: Ciencias Sociales.

Asesor: Dra. Fabiola Mary Talavera Mendoza

AREQUIPA – PERÚ
2021

AGRADECIMIENTO

A la Universidad Nacional de San Agustín de Arequipa por brindarnos los conocimientos y las facilidades para llevar a cabo la investigación, a través de las continuas prácticas preprofesionales y el apoyo de consultoría.

CARACTERÍSTICAS DE LA INVESTIGACIÓN QUE GENERÓ EL ARTÍCULO

Antecedentes, estado del arte

Con la inesperada aparición de la COVID – 19 declarada como una pandemia mundial por la OMS (OMS, 2020), los diversos sectores de la sociedad han tenido cambios repentinos y desafiantes, en especial la educación, donde varios gobiernos han ordenado que se cambie de una educación presencial a una educación a distancia (Daniel, 2020) cancelando la interacción y presencialidad del docente por el uso continuo de la tecnología cancelando la interacción y presencialidad del docente por el uso continuo de la tecnología (García Gonzáles et al., 2020) y por consiguiente se ha incorporado en las escuelas una nueva manera de enseñar y aprender, donde la educación a distancia no era muy popular (Al Lily et al., 2020)

Es por eso que el uso de las tecnologías se ha hecho presente en las escuelas convirtiéndose en herramientas de aprendizajes de gran potencial (Sung, Chang, & Liu, 2016) uno de los primeros en defender el uso de la tecnología en las aulas fue el psicólogo Skinner (De Witte et al., 2015) pues las nuevas generaciones están creciendo en un entorno de computadoras, tabletas y plataformas virtuales (Dreimane, 2019). Sin embargo, el uso excesivo de estas tecnologías trajo algunos problemas (Madaan et al., 2020) como el surgimiento del estrés tecnológico (YANG et al., 2017)

Se ha demostrado que el tecnoestrés y/o estrés tecnológico se relaciona con las características demográficas en trabajadores de instituciones públicas financieras (Marchiori et al., 2019)

Por otra parte en el ámbito educativo, el tecnoestrés también afecta a los docentes (Çoklar et al., 2016) donde se observa que el mayor uso de tecnologías ocasiona fatiga y ansiedad del sistema escolar de Chile (Estrada-Muñoz et al., 2020) así mismo los empleados (académicos y no académicos) de todos los niveles de la organización experimentan cierto nivel de estrés

tecnológico que puede incluir problemas informáticos, adicción a la tecnología, agotamiento laboral y tensión tecno (Sareen, 2019) reduciendo así la satisfacción laboral, el compromiso organizacional y el desempeño relacionado con la tecnología en académicos de la India (Jena, 2015)

Por otro lado, se comprobó que el apoyo técnico adecuado y la relación entre los docentes favoreció en reducir el estrés tecnológico (Joo et al., , 2016). En otro estudio se aplicó el modelo TPACK (conocimiento tecnológico pedagógico de contenidos) y la autoeficacia informática como clave para reducir el estrés tecnológico en profesores de escuela (Dong et al., 2019) y de igual modo los inhibidores del tecnoestrés, como la participación y el apoyo favorecieron a la reducción del mismo en docentes universitarios (Li & Wang, 2020).De igual modo la utilización de móviles en lo estudiante de licenciatura permitió mejorar el rendimiento académico (Qi, 2019),a diferencia de estudiantes de medicina, que usaron la tecnología pero les resulto en un alto estrés (Madaan et al., 2020)

Así mismo en relación al uso de las TIC, se ha demostrado que el acceso, uso e interés excesivo en las TIC está relacionado con un bajo rendimiento en lectura (Gubbels et al., 2020) y es perjudicial para el logro académico cuando se utiliza las TIC en el hogar para las tareas escolares (Agasisti et al., 2020).De igual importancia resulta la escasa supervisión de los padres, cuando los estudiantes usan las TIC (Giménez et al., 2017) lo que puede conllevar a distintos riesgos (Berríos et al., 2015)

- **Justificación**

Se debe tener en cuenta que a pesar de los beneficios del uso de las TIC, hay ciertos riesgos que genera su uso, en los cuales se menciona el tecnoestrés como un impacto negativo en la productividad académica, pese a que los estudiantes están más familiarizados con las TIC (Upadhyaya & Vrinda, 2020) así mismo es considerado como causante de daños fisiológicos y

psicológicos (Riedl, 2012). Por ese motivo, en esta investigación se pretende tomar en cuenta las manifestaciones de comportamientos de tecnoestrés (en las relaciones familiares, funciones vitales, estudio y emociones) en relación al uso reiterado de las TIC. Este trabajo contribuye para dar a conocer los niveles de comportamiento de tecnoestrés en estudiantes de dos colegios públicos de Arequipa en función a las condiciones socio demográficas como (Edad, sexo, teléfono móvil propio y/o compartido), al igual que la frecuencia y amplitud de las TIC

Entonces la trascendencia de esta investigación radica en percibir los comportamientos del tecnoestrés en estudiantes de dos colegios de Arequipa, que tienen diferentes características, ya que la mayoría de estudios se dieron en ámbitos empresariales y/o universidades, enfocándose en profesores y/o estudiantes universitarios, pero no se realizó en estudiantes de instituciones educativas públicas de nivel secundario. En ese sentido se pretende conocer, la utilidad de las TIC por parte de los estudiantes, ya que con el confinamiento social el manejo de las tecnologías aumentó en el ámbito educativo, social y emocional. Por consiguiente, el resultado de esta investigación brindará información importante y relevante a los directores de ambas instituciones, ya que percibirán en qué medida se dio la frecuencia y amplitud de las TIC, así como los comportamientos de tecnoestrés y a partir de ello tomar las medidas necesarias, para orientar e informar a los estudiantes y/o padres de familia.

La investigación es posible debido al apoyo que se tendrá por parte de las autoridades de los dos colegios de Arequipa, para recabar la información por medio de instrumentos realizados en formularios Google.

La limitación para el presente estudio es que no se cuenta con suficientes investigaciones profundas o exhaustivas acerca del tecnoestrés en estudiantes de instituciones educativas públicas de nivel secundario, eso genera que la bibliografía sea un poco limitada. Asimismo, el número de estudiantes que tienen acceso a internet son pocos, la cual ocasionaría dificultades para llegar al

número deseado para la muestra requerida.

- **Problema identificado**

Como se puede constatar la mayoría de las investigaciones es acerca del tecnoestrés en trabajadores de instituciones públicas financieras, en referencia al ámbito educativo se identificó que afecta a los docentes de escuelas y académicos de universidades, pero no se encontró investigaciones profundas a nivel de estudiantes de escuelas públicas.

De esa manera esta investigación se basará en la evaluación comparativa de la frecuencia y amplitud de uso de las TIC y su relación con los comportamientos del tecnoestrés en función de condiciones sociodemográficas (Edad, sexo, teléfono móvil propio y/o compartido) en estudiantes de nivel secundario de dos instituciones educativas.

Responderemos a las siguientes preguntas ¿Qué relación existe entre los comportamientos de tecnoestrés y la frecuencia y amplitud de uso de las TIC de los estudiantes de nivel secundario de dos instituciones educativas? ¿Cuál es el nivel de frecuencia y amplitud de uso de las TIC con relación a sus dimensiones en los estudiantes de nivel secundario de dos instituciones educativas? ¿Cuál es el nivel de comportamiento de tecnoestrés en relación a sus dimensiones? ¿Existe alguna diferencia en los comportamientos de tecnoestrés y la frecuencia y amplitud de uso de las TIC en función de variables demográficas (Edad, sexo, teléfono móvil propio y/o compartido) de los estudiantes de nivel secundario de dos instituciones educativas?

- Objetivos

Objetivo general

- Describir la relación entre los comportamientos de tecnoestrés y la frecuencia y amplitud de uso de las TIC en estudiantes de nivel secundario de dos instituciones educativas.

Objetivos específicos

- Determinar la frecuencia y amplitud del uso de las TIC con relación a sus dimensiones
- Identificar los niveles de comportamiento de tecnoestrés en relación a sus dimensiones
- Analizar las diferencias en los comportamientos de tecnoestrés y la frecuencia y amplitud de uso de las TIC en función a variables demográficas (Edad, sexo, teléfono móvil propio y/o compartido) en estudiantes de nivel secundario de dos instituciones educativas

Metodología de la Investigación

La presenta investigación tuvo un enfoque cuantitativo con un estudio no experimental y un diseño transversal correlacional, ya que hay dos o más variables que se relacionan entre sí (Hernández et al., 2014). En ese sentido se toma en cuenta a 2 instituciones educativas nacionales con una población de 1924 Estudiantes, sin embargo, no se llega a la muestra requerida a causa de la falta de interacción con todos los estudiantes de ambos colegios. El muestreo realizado es no probabilístico intencional, debido a que no se utiliza ninguna fórmula, porque depende del proceso de toma de decisiones de los investigadores (Hernández et al., 2014) ya que se aplicó a 100 estudiantes de segundo año de secundaria. Los criterios para la selección fueron, la interacción directa de las investigadoras con los estudiantes, el nivel de conectividad y acceso a internet de los mismos, el carácter voluntario de acceso a las encuestas y el término del VI ciclo de educación básica regular. Para ello se tuvo en cuenta el consentimiento informado a los directores de las dos instituciones educativas y el permiso respectivo de los padres de familia por ser menores de edad.

El procedimiento se dio gracias a las siguientes etapas:

1. Se solicitó las autorizaciones correspondientes a las instituciones educativas

2. Se brindó consentimientos informados a los padres de familia para el llenado de dichos cuestionarios
3. Se aplicó de los instrumentos a través de formularios google para la aplicación de los dos instrumentos.

Las técnicas de investigación que se realizará para la obtención de resultados de la investigación son los siguientes:

Al ser una investigación no experimental se utilizará la técnica de la encuesta, con sus respectivos instrumentos que son: cuestionario para medir la frecuencia y amplitud del uso de las TIC, este instrumento fue adaptado (Jiménez Rodríguez et al., 2017), la cual consta de 28 items. El cuestionario de comportamientos de tecnoestrés fue elaborado por (Coppari et al., 2018), el cual consta de 35 ítems, donde se vio por conveniente eliminar el indicador “Relaciones de pareja”, ya que no se consideró pertinente para la población estudiada, el cual también se adaptó.

Por lo tanto, ambos cuestionarios pasaron por la validación de 3 expertos. La confiabilidad de los instrumentos fue calculada mediante el coeficiente de consistencia interna de Cronbach, que reporto resultados aceptables para ambos cuestionarios con un 0.855 y 0,906, cumpliendo una fiabilidad alta.

Una vez recogido los datos obtenidos se procedió a sistematizar la información utilizando las herramientas estadísticas Excel y el uso del soporte informático SPSS 24. Para confirmar la correlación entre ambas variables se utilizó el estadístico no paramétrico Rho de Spearman. Para la comparación de la variable frecuencia y amplitud del uso de las TIC con las variables sociodemográficas, se aplicó el estadístico paramétrico T de Student y para la comparación de la variable comportamientos de tecnoestrés, se correlaciono también con las variables sociodemográficas, a través del estadístico no paramétrico U de Mann Whitney.

- **Hipótesis**

Hi - Existe una relación significativa entre los comportamientos de tecnoestrés y la frecuencia de uso de las TIC de los estudiantes de nivel secundario de dos instituciones educativas

Ho - No Existe una relación significativa entre los comportamientos de tecnoestrés y la frecuencia de uso de las TIC de los estudiantes de nivel secundario de dos instituciones educativas

- **Marco teórico**

FRECUENCIA DE USO DE LAS TIC

Las motivaciones para hacer uso de las TIC y conectarse a internet son para pasar el rato, compartir con nuevas amistades, comunicación con los demás y para buscar información útil en el ámbito educativo (Sanches-Navarro & Aranda, 2011) (Salehan & Negahban, 2013)Es por ello que el uso de

ordenadores portátiles tiene mayor presencia en actividades académicas (Organista-Sandoval et al., 2017). Y muchas veces la inversión tecnológica por parte de estudiantes y/o jóvenes es significativa donde la mayoría posee equipos tecnológicos (Arévalo Hermida, Araujo Sandoval, & Mieles Bachicoria, 2019).

CONDUCTAS Y EMOCIONES POR LAS TIC

Pero el uso de internet y redes sociales aumentó y tuvo algunos impactos negativos, como su uso incontrolable y los riesgos de ello (Muhametjanova et al., 2019) donde los jovenes eligen conectarse a internet, por una sensación de tranquilidad y alivio (Jiménez Rodríguez et al., 2017). Y de igual modo, el abuso de la tecnología provoca aislamiento, induce a la ansiedad, afecta a la autoestima y le hace perder al sujeto su capacidad de control. (Odriozola, 2012)

Por lo tanto, en el presente estudio se examinará los niveles de frecuencia y amplitud en juegos en línea/redes sociales/mensajería, en el ámbito educativo, conductas/emociones generadas por las TIC.

TECNOESTRÉS

En cuanto al tecnoestrés, ha sido acuñado como "una enfermedad moderna de la adaptación causada por la incapacidad para hacer frente a las nuevas tecnologías informáticas de manera saludable" (Brod, 1984, pág. 16), el cual puede causar problemas de salud tanto físicos o psicológicos cuando se utiliza el internet y de la misma manera el afán por aprender a usar un nuevo dispositivo pueden causar daños, fatiga, trastornos y agotamiento por la necesidad de actualizar la tecnología todo el tiempo. (Boonjing & Chanvarasuth, 2017)

TIPOS DE TECNOESTRES

Los tipos de tecnoestrés se diferencian entre (I)tecno-ansiedad que se refiere a la angustia y miedo por el uso de alguna tecnología , (II) tecno-fatiga, que se caracteriza por el cansancio o fatiga a causa del uso constante de las TIC, y finalmente tenemos a la (III) tecno-adicción que se refiere a la necesidad incontrolable por utilizar las TIC en cualquier momento y por tiempos prolongados. (Salanova, 2007)

INHIBIDORES Y CREADORES DE TECNOESTRES

Los inhibidores o moderadores del estrés son aquellos que pueden disminuir el grado de tecnoestrés (La Torre et al., 2019) como es el: (I)soporte técnico y organizativo que se refiere a la instrucción o adiestramiento que se da a la usuarios para enfrentar las nueva tecnologías, (II) alfabetización, y por último (III) el involucrar a los actores en lo que se refiere a la planificación y puesta en marcha del sistema, ya que esto les ayudará a acostumbrarse con estas aplicaciones, y de esa forma reducirá los factores estresantes (Ragu-Nathan et al., 2008)

En contraste , también tenemos a los creadores del tecnoestrés que son aquellas situaciones o factores de las TIC que tienen el poder de crear presión o tensión en los trabajadores (Fuglseth & Sørebø, 2014), estos creadores del tecnoestrés son: (I) la sobrecarga tecnológica que se refiere a que presionan a los usuarios a trabajar por un tiempo prolongado y con rapidez,

(II)tecno-invasión, se refiere al poder de invadir la vida personal del usuario, (III) la tecno-complejidad, se presenta en los usuarios cuando existe más presión en el desarrollo de las actividades, puesto que demanda más tiempo en aprender y comprender sus usos,(IV)la tecno-inseguridad que conlleva a las personas a pensar que van a perder sus puestos laborales por el poco conocimiento de las tecnologías, por último esta la (V)la tecno-incertidumbre, que se presenta por los cambios constantes en el avance de la tecnología y el nivel de alfabetización que deben de tener los usuarios (Tarafdar et al., 2007)) (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007)

COMPORTAMIENTOS DE TECNOESTRES

Ante lo dicho anteriormente, podemos agregar que el tecnoestrés está relacionado con los impactos psicosociales negativos a causa de la utilización de las tecnologías, en ese sentido se hace referencia a los comportamientos de impacto en el estudio, en las relaciones familiares, funciones vitales y el ánimo y/emociones (Coppari et al., 2018)

El uso de las TIC puede tener efectos negativos en lo académico, puesto que se destina una menor cantidad de tiempo a los estudios y en ocasiones las TIC generan distracciones en clases (Díaz-Vicario et al., 2019). Asimismo su uso puede ocasionar malas relaciones con los padres (Punamäki et al., 2009) (Ahmadi & Saghafi, 2013), obstaculizar las relaciones sociales (Nobles Montoya et al., 2016) y alterar los hábitos de sueño, cuando se hace uso de los teléfonos móviles de forma intensiva (Punamäki et al., 2007)De igual manera, el abuso de las redes sociales facilita el aislamiento y problemas conductuales en los adolescentes (Odriozola, 2012)

Por ello, nuestro estudio se enfocará en ver los comportamientos de tecnoestrés en los estudios, relaciones familiares, funciones vitales y emociones.

REFERENCIAS

Al Lily, A., Ismail, A., Abunasser, F., & Alqahtani, R. (2020). Distance education as a response to pandemics: Coronavirus and Arab culture. *Technology in Society, 63*, 101317. doi:https://doi.org/10.1016/j.techsoc.2020.101317

Marchiori, D. M., Mainardes, E. W., & Rodrigues, R. G. (2019). Do individual characteristics influence the types of technostress reported by workers? *International Journal of Human–Computer Interaction, 35*(3), 218-230. doi:https://doi.org/10.1080/10447318.2018.1449713

Punamäki, R.-L., Wallenius, M., Nygard, C.-H., Saarni, L., & Rimpela, A. (2007). Use of information and communication technology (ICT) and perceived health in adolescence: the role of sleeping habits and waking-time tiredness. *Journal of adolescence, 30*(4), 569-585. doi:https://doi.org/10.1016/j.adolescence.2006.07.004

Agasisti, T., Gil-Izquierdo , M., & Han, S. (2020). ICT Use at home for school-related tasks: what is the effect on a student's achievement? Empirical evidence from OECD PISA data. *Education Economics*, 1-20. doi:https://doi.org/10.1080/09645292.2020.1822787

Ahmadi, K., & Saghafi, A. (2013). Psychosocial profile of Iranian adolescents' Internet addiction. *Cyberpsychology, Behavior, and Social Networking, 16*(7), 543-548. doi:https://doi.org/10.1089/cyber.2012.0237

Arévalo Hermida, R., Araujo Sandoval, O., & Mieles Bachicoria, S. (2019). Tendencia de uso de tecnología en estudiantes universitarios del cantón El Carmen - Manabí. *Rev. SINAPSIS, 1*(14). doi:https://doi.org/10.37117/s.v1i14.193

Berríos, L., Buxarrais, M.-R., & Garcés, M.-S. (2015). ICT Use and Parental Mediation Perceived by Chilean Children. *Comunicar, 23*(45), 161-168. doi:http://dx.doi.org/10.3916/C45-2015-17

Boonjing, V., & Chanvarasuth, P. (2017). Risk of overusing mobile phones: Technostress effect. *Procedia Computer Science*, 196-202. doi:https://doi.org/10.1016/j.procs.2017.06.053

Brod, C. (1984). *Technostress: The human cost of the computer revolution.* Reading, Mass.: Addison-Wesley.

Çoklar, A. N., Efilti, E., Sahin, Y. L., & Akçay, A. (2016). Investigation of Techno-Stress Levels of Teachers Who Were Included in Technology Integration Processes. *TOJET: The Turkish Online Journal of Educational Technology*, 1331-1339. doi:https://bit.ly/2TCENhG

Coppari, N., Bagnoli, L., Codas, G., Martínez, Ú., & Martínez, L. (2018). Validez y confiabilidad del cuestionario de tecnoestrés en estudiantes paraguayos. *Perspectivas en Psicología, 15*(2), 40-55. Obtenido de https://bit.ly/2ILNeWv

Daniel, S. (2020). Education and the COVID-19 pandemic. *PROSPECTS. Advance online publication*, 91–96. doi:https://doi.org/10.1007/s11125-020-09464-3

De Witte, K., Haelermans, C., & Rogge, N. (2015). The effectiveness of a computer-assisted math learning program. *Journal of Computer Assisted Learning, 31*(4), 314-329. doi:https://doi.org/10.1111/jcal.12090

Díaz-Vicario, A., Mercader Juan, C., & Gairín Sallán, J. (2019). Uso problemático de las TIC en adolescentes. *Revista electrónica de investigación educativa, 29*, 1-11. doi:https://doi.org/10.24320/redie.2019.21.e07.1882

Dong, Y., Xu, C., Chai, C., & Zhai, X. (2019). Exploring the Structural Relationship Among Teachers' Technostress, Technological Pedagogical Content Knowledge (TPACK), Computer Self-efficacy and School Support. *The Asia-Pacific Education Researcher*, 1-11. doi:https://doi.org/10.1007/s40299-019-00461-5

Dreimane, S. (2019). Gamification for education: Review of current publications. *In Didactics of smart pedagogy*, 453-464. doi:https://doi.org/10.1007/978-3-030-01551-0_23

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), 5280. doi:https://doi.org/10.3390/ijerph17155280

Fuglseth, A., & Sørebø, Ø. (2014). The effects of technostress within the context of employee use of ICT. *Computers in Human Behavior, 40*, 161-170. doi:https://doi.org/10.1016/j.chb.2014.07.040

García Gonzáles, M. A., Torrano, F., & García González, G. (2020). Analysis of stress factors for female professors at online universities. *International journal of environmental research and public health, 17*(8), 2958. doi:https://doi.org/10.3390/ijerph17082958

Giménez, A. M., Luengo, J. A., & Bartrina, M. J. (2017). What are young people doing on Internet? Use of ICT, parental supervision strategies and exposure to risks. *Electronic Journal of Research in Educational Psychology, 15*(3), 533–552. doi:https://doi.org/10.14204/ejrep.43.16123

Gubbels, J., Swart, N., & Groen, M. (2020). Everything in moderation: ICT and reading performance of Dutch 15-year-olds. *Large-scale Assessments in Education, 8*(1), 1. doi:https://doi.org/10.1186/s40536-020-0079-0

Hernández, R., Fernández, C., & Baptista, P. (2014). *Metodología de la Investigación. (6ª ed.).* Mexico: Mc Graw Hill Interamericana Editores.

Jena, R. (2015). echnostress in ICT enabled collaborative learning environment: An empirical study among Indian academician. *Computers in Human Behavior, 51*, 1116-1123. doi:https://doi.org/10.1016/j.chb.2015.03.020

Jiménez Rodríguez, V., Alvarado Izquierdo, J. M., & Llopis Pablos, C. (2017). Validación de un cuestionario diseñado para medir frecuencia y amplitud de uso de las TIC. *Edutec. Revista electrónica de tecnología educativa*(61), 368-368. doi:https://doi.org/10.21556/edutec.2017.61.949

Joo, Y., Lim, K., & Kim, N. (2016). The effects of secondary teachers' technostress on the intention to use technology in South Korea. *Computers & Education, 95*, 114-122. doi:https://doi.org/10.1016/j.compedu.2015.12.004

La Torre, G., Esposito, A., Sciarra, I., & Chiappetta, M. (2019). Definition, symptoms and risk of techno-stress: a systematic review. *International archives of occupational and environmental health, 92*(1), 13-35. doi:https://doi.org/10.1007/s00420-018-1352-1

Li, L., & Wang, X. (2020). Technostress inhibitors and creators and their impacts on university teachers' work performance in higher education. *Cognition, Technology & Work*, 1-16. doi:https://doi.org/10.1007/s10111-020-00625-0

Madaan, N., Wundavalli, L., & Satapathy, S. (2020). Techno stress among medical freshmen: An exploratory study. *Journal of Education and Health Promotion*, 178. doi: https://doi.org/10.4103/jehp.jehp_242_19

Muhametjanova, G., Afacan Adanır, G., & Akmatbekova, A. (2019). Internet and social networks use habits of adolescents between ages of 10-19 in the Kyrgyz Republic. *Journal of Children and Media*, 1-14. doi: https://doi.org/10.1080/17482798.2019.1684965

Nobles Montoya, D., Londoño Ocampo, L., Martínez Plutarco, S., Ramos Arias, A., Santa Mellao, G., & Cotes Salgado, A. (2016). Tecnologías de la comunicación y relaciones. *Educación y Humanismo, 18*(30), 14-27. doi: http://dx.doi.org/10.17081/eduhum.18.30.1311

Odriozola, E. (2012). Factores de riesgo y factores de protección en la adicción a las nuevas tecnologías y redes sociales en jóvenes y adolescentes. *Revista española de drogodependencias*(4), 435-48. Obtenido de https://bit.ly/2UMEQZ4

OMS. (11 de Marzo de 2020). *Organizacion Mundial de la Salud*. Obtenido de https://www.who.int/es/emergencies/diseases/novel-coronavirus-2019/advice-for-public/q-a-coronaviruses?gclid=Cj0KCQjwreT8BRDTARIsAJLI0KLVgbxijRRxJp0FATZuEkCao77iGpSNlFpKjOOwf_ECm8EZqk6y6U4aAnCDEALw_wcB

Organista-Sandoval, J., Lavigne, G., Serrano-Santoyo, A., & Sandoval-Silva, M. (2017). Desarrollo de un cuestionario para estimar las habilidades digitales de estudiantes universitarios/Development of a questionnaire to estimate undergraduate digital skills. *Revista Complutense de Educación*, 325 - 343. doi:https://doi.org/10.5209/rev_RCED.2017.v28.n1.49802

Punamäki, R.-L., Wallenius, M., Hölttö, H., Nygård, C.-H., & Rimpelä, A. (2009). The associations between information and communication technology (ICT) and peer and parent relations in early adolescence. *International Journal of Behavioral Development, 33*(6), 556–564. doi:https://doi.org/10.1177/0165025409343828

Qi, C. (2019). A double-edged sword? Exploring the impact of students' academic usage of mobile devices on technostress and academic performance. *Behaviour & Information Technology, 38*(12), 1337-1354. doi:https://doi.org/10.1080/0144929X.2019.1585476

Ragu-Nathan, T., Tarafdar, M., Ragu-Nathan, B., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information systems research, 19*(4), 417-433. doi:https://doi.org/10.1287/isre.1070.0165

Riedl, R. (2012). On the biology of technostress: literature review and research agenda. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 18-55. doi:10.1145 / 2436239.2436242

Salanova, M. (2007). Nuevas tecnologías y nuevos riesgos psicosociales en el trabajo. Obtenido de https://bit.ly/323i3MJ

Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior, 29*(6), 2632-2639. doi:https://doi.org/10.1016/j.chb.2013.07.003

Sanches-Navarro, J., & Aranda, D. (2011). Internet como fuente de información para la vida cotidiana de los jóvenes españo. *El profesional de la información, 20*(1), 32-37. Obtenido de https://bit.ly/3qZUO0R

Sareen, P. (2019). Techno Stress Creators-An Exploratory Research on Teaching and Non-Teaching Staff Working in Colleges. *International Journal of Management and Humanities (IJMH), 3*(9). doi:https://bit.ly/3oAALVx

Sung, Y. T., Chang, K. E., & Liu, T. C. (2016). The effects of integrating mobile devices with teaching and learning on student learning performance: a meta-analysis and research synthesis. *Computadoras y educación, 94*, 252-275. doi:https://doi.org/10.1016/j.compedu.2015.11.008

Tarafdar, M., Tu, Q., Ragu-Nathan, B., & Ragu-Nathan, T. (2007). The Impact of Technostress on Role Stress and Productivity. *Journal of management information systems, 24*(1), 301-328. doi:https://doi.org/10.2753/MIS0742-1222240109

Upadhyaya, P., & Vrinda. (2020). Impact of technostress on academic productivity of university students. Educ Inf Technol. *Education and Information Technologies*, 1-18. doi:https://doi.org/10.1007/s10639-020-10319-9

YANG, R. J., YANG, J. Y., Yuan, H. R., & Li, J. T. (2017). Techno-stress of teachers: an empirical investigation from china. *The Third International Conference on Education and Social Development* (págs. 603-608). EE.UU.: DEStech publications. doi:https://doi.org/10.12783/dtssehs/icesd2017/11619

TIPO DE PARTICIPACIÓN DEL ALUMNO

Yudit Yessica, CHOQQUE CABRERA

- Contribución en la concepción del estudio.
- Análisis e interpretación de los datos.
- Revisión y aprobación de la versión final del manuscrito.

Mayra Janet, MALAGA VILLALBA

- Contribución en la concepción del estudio.
- Análisis e interpretación de los datos.
- Revisión y aprobación de la versión final del manuscrito.

Technostress in The Frequency of Use of ICT

Yudit Y. Choqque-Cabrera
Universidad Nacional de San Agustín de Arequipa
ychoqque@unsa.edu.pe

Mayra J. Malaga-Villalba
Universidad Nacional de San Agustín de Arequipa
mmalagav@unsa.edu.pe

Fabiola M. Talavera-Mendoza
Universidad Nacional de San Agustín de Arequipa
ftalaveram@unsa.edu.pe

ABSTRACT

The purpose of this study was to investigate how the uses of ICTs in these new virtual learning scenarios generate well-being, study-level impact or positive or negative behaviours. In this sense, the objective of this work was to describe the relationship between technostress behaviours and the frequency and extent of ICT use of secondary school students in two public educational institutions. The approach is quantitative with a non-experimental study and a cross-sectional correlational design. The sample is non-probabilistic with a group of 100 students. The level of technostress found is medium in the dimensions mood, emotions, family relationships and friends. The perceived finding is that students who own their own cell phones have a higher level of technostress, which is reflected in the greater use and frequency of ICTs.

CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI).

KEYWORDS

ICT, Behaviour, Technostress

ACM Reference Format:
Yudit Y. Choqque-Cabrera, Mayra J. Malaga-Villalba, and Fabiola M. Talavera-Mendoza. 2021. Technostress in The Frequency of Use of ICT. In *2021 3rd International Conference on Modern Educational Technology (ICMET '21), May 21–23, 2021, Jakarta, Indonesia.* ACM, New York, NY, USA, 7 pages. https://doi.org/10.1145/3468978.3468994

1 INTRODUCTION

With the unexpected appearance of COVID - 19 declared as a global pandemic by the WHO [1] the various sectors of society have had sudden and challenging changes, especially education, where several governments have ordered to change from face-to-face education to distance education [2] cancelling the interaction and presentiality of the teacher by the continuous use of technology [3], consequently a new way of teaching and learning has been incorporated in schools, where distance education was not very popular [4].

ICMET '21, May 21–23, 2021, Jakarta, Indonesia

ACM ISBN 978-1-4503-9035-4/21/05…$15.00
https://doi.org/10.1145/3468978.3468994

That is why the use of technologies has become present in schools becoming learning tools of great potential [5] one of the first to defend the use of technology in the classroom was the psychologist Skinner [6] because the new generations are growing up in an environment of computers, tablets and virtual platforms [7]. However, the excessive use of these technologies brought some problems [8] such as the emergence of technological stress [9].

It has been shown that technostress and/or technological stress is related to demographic characteristics in workers of public financial institutions [10]. On the other hand in the educational field, technostress also affects teachers [11] where increased use of technologies is observed to cause fatigue and anxiety of the school system in Chile [12], likewise employees (academic and non-academic) experience some level of technology stress which may include computer problems, technology addiction, job burnout and techno-stress [13] thus reducing job satisfaction, organizational commitment and technology-related performance in Indian academics [14].

On the other hand, it was found that adequate technical support and the relationship between teachers favoured the reduction of technological stress [15]. In another study, the TPACK model (technological pedagogical content knowledge) and computer self-efficacy were applied as a key to reduce technological stress in school teachers [16] and similarly, technostress inhibitors, such as participation and support, favoured its reduction in university teachers [17]. In relation to the use of telephones in undergraduate students, it improved academic performance without generating technostress [18], unlike medical students who used these technologies causing them high stress [8].

Regarding ICTs, international studies show that excessive access, use and interest in these technologies is related to poor reading performance [19], as well as being detrimental to the development of homework at home [20]. However, it was verified that there are similarities in terms of the use that adults and adolescents make of cell phones, highlighting that both groups use instant messaging and social networks [21]. Now, if we talk specifically about Peru interms of the use of cell phones, it has been identified that in 2019 78% of Peruvian households have a cell phone, which is mainly used to access social networks [22], despite this there are still students who do not have access to the Internet who come from peripheral areas [23], This can be seen in the INEI technical report for thelast quarter of 2020, which shows that access to a computer and internet in metropolitan Lima is 67%, in contrast to households in rural areas, which only reach 10% [24].

As can be seen, most of the research on technostress was carried out in terms of companies, workers and teachers of universities, but no in-depth research was found at the level of public-school students.

ICT is "The set of technologies that allow the acquisition, production, storage, treatment, communication, recording and presentation of information, in the form of voice, images, videos, sounds and animation" [25].

In this way, the conceptions analysed focused on the motivations for making use of ICTs and connecting to the Internet, from the perspective of the enjoyment that comes with sharing, making new friends and searching for information in the educational field [26]. Therefore, the use of technological equipment has become a necessity [27], which leads to continuous use of the Internet and social networks and can create negative impacts, such as uncontrollable use and behavioural changes [28], isolation, anxiety, low self-esteem that makes the subject lose their ability to control [29]. However, there are other experiences of tranquillity and relief generated by its use [30].

As for technostress, it has been coined as "a modern disease of adaptation caused by the inability to cope with new computer technologies in a healthy way" [31], which can cause both physical and psychological health problems when the Internet is used excessively causing damage, fatigue, disorders and burnout [32].

The types of technostress are differentiated between (I) techno-anxiety that refers to the anguish and fear for the use of some technology, (II) techno-fatigue that is characterized by tiredness or fatigue due to the constant use of ICT and finally we have (III) techno-addiction that refers to the uncontrollable need to use ICT at any time and for prolonged periods of time [33].

But we also have stress inhibitors or moderators that can decrease the degree of technostress such as: (I) Giving technical and organizational support, (II) literacy and finally (III) involving the actors in what refers to the planning and implementation of the system, as this will help them to get used to these applications and thus reduce the stressors [34]. In contrast we also have the creators of technostress which are those ICT situations or factors that have the power to create pressure or tension in workers [35], these creators of technostress are: (I) technological overload which refers to the fact that they pressure users to work for a prolonged time and quickly, (II) techno-invasion, refers to the power to invade the user's personal life, (III) techno-complexity, occurs in users when there is more pressure in the development of activities since it demands more time to learn and understand its uses, (IV) techno-insecurity, which leads people to think that they will lose their jobs because they have little knowledge of the technologies, and finally, (V) techno-uncertainty, which occurs because of the constant changes in the progress of technology and the level of literacy that users must have [36].

Given what has been said above, we can add that technostress causes problems of both individual and social well-being bringing with it difficulties in concentration, sleep and social relationships [37]. In this way we can point out that technological stress is related to negative psychosocial impacts due to the use of technologies, in that sense it refers to impact behaviours on study, family relationships, vital functions, mood and / or emotions [38].

The use of ICTs can have negative effects on academics, since less time is devoted to studies and they sometimes generate distractions in the classroom [39]. Likewise, their use can cause poor relationships with parents [40], hinder social relationships [41] and alter sleep habits when cell phones are used intensively [42]. Similarly, abuse of social networks facilitates isolation and behavioural problems in adolescents [29].

Therefore, our study focuses on the comparative evaluation of the frequency and extent of ICT use and its relationship with technostress behaviours as a function of sociodemographic conditions (age, gender, own and/or shared cell phone) in high school students from two educational institutions.

To address this paucity of knowledge, our study attempts to answer the following research questions: What is the relationship between technostress behaviours and the frequency and extent of ICT use of secondary level students in two educational institutions? What is the level of ICT frequency and use in relation to its dimensions in secondary level students in two educational institutions? What is the level of technostress behaviour in relation to its dimensions? Is there any difference in technostress behaviours and frequency and extent of ICT use as a function of sociodemographic conditions (Age, gender, own and/or shared cell phone) of secondary level students of two educational institutions?

2 METHODOLOGY

The present research had a quantitative approach with a non-experimental study and a cross-sectional correlational design, since there are two or more variables that are related to each other [43].

In this sense, two national educational institutions in the province of Arequipa-Peru were taken into account, with a population of 1,924 students; however, the representative sample was not reached due to the lack of interaction with all the students in both schools. The sample is non-probabilistic, since "the choice of the units does not depend on probability, but on reasons related to the characteristics and context of the research" [43], the surveys processed were of 100 students in the second year of high school. The criteria for the selection were; the direct interaction of the researchers with the students, their level of connectivity and access to the Internet, the voluntary nature of access to the surveys and the ages ranging from 13 to 14 years in regular basic education students. Informed parental consent and the respective permission of the educational institutions were taken into account.

2.1 Procedure

The procedure was carried out in 3 stages:

- First stage: Requesting the corresponding authorizations from the educational institutions for the application of the two instruments.
- Second stage: The authorization of the Educational Institution and parents to be able to execute the instruments.
- Third stage: Application of the instruments taking into account the informed consent through the Google Form.

The research techniques used to obtain the research results are as follows:

Being a non-experimental research, the survey technique was used with its respective instruments, which are: questionnaire to measure the frequency and extent of ICT use [30], this instrument was adapted, which consists of 28 items. The second instrument is the questionnaire of technostress behaviours [38], which has 35

Table 1: Characterization of the study sample

	Frequency	Percentage
	n = 100	% = 100.0
Age		
13 years old	48	48
14 years old	52	52
Sex		
Female	28	28
Male	72	72
Cell phone possession		
Own	59	59
Shared	41	41
College		
A	60	60
B	40	40

Table 2: Level of the dimensions of the variable frequency and amplitude of ICT use.

Levels	Frequency and use of ICTs for gaming, messaging and social networks	Utility of ICT in education	Behaviour / emotions generated by ICTs
Under	24%	2%	58%
Moderate	68%	35%	39%
High	8%	63%	3%
Total	100%	100%	100%

items, where it was convenient to eliminate the indicator "Relationships", since it was not considered relevant for the population studied, which was also adapted.

The applications of the two questionnaires were carried out through Google Forms, in the case of the first one it lasted approximately 5 minutes and the second one 8 minutes respectively, they were applied in the course of a week. Both questionnaires were validated by 3 experts. The reliability of the instruments was calculated by means of Cronbach's internal consistency coefficient, which reported acceptable results for both questionnaires with 0.855 and 0.906, thus fulfilling a high reliability.

Once the data had been collected, the information was systematized using Excel statistical tools and SPSS 24 software. The normality test, Kolmogorov - Smirnov (K -S), was used to obtain the significance of both variables. Spearman's Rho nonparametric statistic was used to confirm the correlation between both variables. For the comparison of the variable frequency and extent of ICT use with the sociodemographic conditions, the Student's t-statistic was applied and for the comparison of the variable technostress behaviours, it was also correlated with the sociodemographic conditions, through the nonparametric Mann Whitney U statistic.

3 RESULT

Regarding demographic characteristics, Table 1 shows that more than half of the students are 14 years old and are in the second grade of secondary education, slightly less than three quarters are male and most of them have their own cell phone.

Table 2 shows that only in the dimension of the usefulness of ICTs in the educational environment, more than 63% of students in the second grade of secondary education are at the high level, a percentage far removed from the other dimensions, which do not exceed 8%. On the other hand, at the low level, only 58% of students are in the behaviour and/or emotions generated by ICTs dimension, a percentage that is also very far from that of the other two dimensions.

Table 3 shows that, in general, students tend to place themselves between the under and medium levels in the four dimensions of technostress, with percentages higher than 27%. Specifically, at a low level, the impact behaviours on the study and on their vital functions tend to the fact that technostress does not affect these dimensions. At a medium level, the impact behaviours on their relationships and their mood and/or emotions are greater than 53%, which does not constitute a threat in the face of technological demand.

Table 4 relates the sample of the behaviour of technostress and the frequency and extent of ICT use of secondary school students in the educational institutions, showing that there is a weak posi- tive significant relationship, since the Spearman's Rho correlation coefficient assumes a value of .425 with p = .000. In other words, the greater the frequency and extent of ICT use, the greater the technostress among students in the second grade of secondary education.

Table 5 shows that the frequency and extent of ICT use revealed by students 13 and 14 years of age, as well as male and female students are similar, with p = ,520 and ,453 respectively. In contrast,

Table 3: Level of the dimensions of the variable technostress behaviours

Levels	Impact behaviours in the study	Relationship impact behaviours	Impact behaviours on vital functions	Behaviours that have an impact on mood and/or emotions.
Under	63%	45%	70%	37%
Medium	36%	54%	28%	60%
High	1%	1%	2%	3%
Total	100%	100%	100%	100%

Table 4: Correlation between frequency and amplitude of ICT use and techno-stress behaviours

			Frequency and extent of ICT use	Technostress behaviours
Spearman's Rho	Frequency and extent of ICT use	Correlation coefficient	1.000	.425**
		Sig. (bilateral)		.000
		N	100	100

[a] The correlation is significant at the 0.01 level (bilateral).

Table 5: Comparison between the frequency and extent of ICT use and sociodemographic conditions

Sociodemographic conditions		N	Mean	Parametric statistic	sig.
Age	13 years old	46	57.41	Student's t test for ind. samples	.520
	14 years old	52	55.56		
Sex	Male	72	56.83	Student's t test for ind. samples	.453
	Female	28	54.43		
Possession of	Own	59	58.59	Student's t test for ind. samples	.041
	Shared	41	52.66		
College	A	60	58.75	Student's t test for ind. samples	.026
	B	40	52.28		

Table 6: Comparison between technostress behaviours and sociodemographic conditions

Sociodemographic conditions		N	Average range	Nonparametric statistic	sig.
Age	13 years old	46	47.78	Mann-Whitney U	.574
	14 years old	52	51.02		
Sex	Male	72	52.11	Mann-Whitney U	.373
	Female	28	46.36		
Possession of	Own	59	56.98	Mann-Whitney U	.007
	Shared	41	41.17		
College	A	60	52.53	Mann-Whitney U	.390
	B	40	47.45		

the frequency and extent of ICT use among students who have their own or shared cell phones and students enrolled in schools A and B differ significantly, with p = .041 and p = .026, respectively. Specifically, students who have their own cell phone and students enrolled in school A are those who present a higher frequency and amplitude of ICT use.

Table 6 shows that the technostress behaviours presented by students 13 and 14 years of age; male and female students; and students from school A and B are similar. That is to say that there is no statistically significant difference in the technostress behaviours in second grade high school students according to their age, sex and school where they are enrolled, at p > .05, in each of the sociodemographic conditions indicated.

On the other hand, only between students who have their own cell phone and those who share it, their technostress behaviours differ significantly, with a p = .007. Being, students who have their own cell phone those who present greater technostress.

4 DISCUSSION AND CONCLUSIONS

The present study shows that the greater the frequency and extent of ICT use, the greater the technostress in students in the second year of secondary education, noting that students who have their own cell phones are those who have greater technostress with a medium level affecting their emotions and / or mood. Similarly, in the study by Ayyagari et al. [44] the same relationship was found, because in the theory we can find that technological stress has detrimental effects that are manifested in people by the excessive use of technology [45], which causes negative attitudes, behaviours and thoughts that affect emotional tranquillity [46].

In reference to the level of frequency and use of ICTs in relation to their dimensions, utility shows a high value in the application for the educational environment, associating it with the need to perform school tasks, group work, search for information and in the investigation. Similarly, Zilka [47] found that adolescents use the Internet very frequently to carry out their school activities, as did Sapién et al. [48] who identified that students use the Moodle platform more for the same purpose. It is stated that the incorporation of these tools was successful in the educational field [49], so that the use of ICT becomes an inevitable aspect in everyday life that promotes learning [50].

Likewise, in the measurement of the behavioural levels of technostress in its dimensions mood and relationships (family - friends), its valuation is medium, it can be perceived that technostress has not yet caused anxiety, aggressiveness and irritability in the interac-tions both in the use of technologies and in their relationships withtheir family and friends, showing a calm and paused behaviour in the management especially of their emotions. From another perspective, it can be evidenced that technostress was also presented at a moderate level, but with negative effects on the measurement of academic performance [51].

Regarding the relationship of the frequency and extent of ICT use with sociodemographic conditions, we have that students who own their own cell phone and those who are enrolled in school A are those who make the most use of these technologies, but like the other groups they do not present difficulties in detaching themselves from technologies or social networks, that is to say that their daily activities do not depend directly on the use and frequency of ICT, corroborating that in this result there is no difference in gender or age. Like Aktaş and Yılmaz [52] where he points out that females and males obtained similar scores in terms of Smartphone use in the search for information and entertainment. In contrast to the study by Torres-Díaz et al. [53], it was shown that female students are the least dependent on the use of technologies.

On the other hand, regarding the relationship of technostress behaviours with sociodemographic conditions, it is reflected that there is no major difference, since the average age of the students is 13 to 14 years old and technostress is manifested at a medium level in the sense that a difference can be found between students who have their own cell phone and those who do not. Showing a medium technostress in the case of the former, as a result of the availability they have to use cell phones at any time, place and hour. Similarly, Lee et al. [54] points out that technostress affects personal life due to excessive use of the cell phone. However, the use of the smartphone in everyday life within its benefits facilitates mobility and accessibility, but due to this ubiquitous nature can also generate certain levels of stress in people [55].

In the findings found in this research, the first is that second year high school students do not yet have negative experiences such as fatigue and irritability in the use and management of ICT, finding only 3% of students with a high level of technostress. This result leads us to argue that technostress is related to the frequency and use that is given to technologies which can generate some dependence in students. In reference to this finding, Salanova [33] states that technologies are neutral because their effects are generated according to the factors that are present. The second finding refers to students who have their own cell phones, who present a medium technostress with whom it is necessary to have control and monitoring by both parents and teachers so that this does not later have an impact on their mood, interpersonal relationships, academic performance and vital functions and finally the third finding allows finding a positive side in that students moderately generate friendship and companionship through access to social networks and instant messaging, which indicates that they are not totally isolated in the interaction with other people.

Within the limitation of this study, it is found that most of the students belong to the male sex, so it is not possible to generalize the results in relation to the significant difference between men and women in the use of mobile technology. Another aspect that has not been addressed is to evaluate the level of learning or academic performance acquired during this stage of confinement to make its relationship with the applied instruments of technostress and frequency of ICT use, since there were deficiencies in the approach by the Ministry of Education of Peru for the correct use of formative evaluation. Finally, another limiting factor was the scarce access of students to the online questionnaires due to lack of connectivity and not having this culture of participating in the data collection. How to reach them in future studies?

The present study indicates that technostress behaviours are related to technology, that is, they have a weak positive significant relationship. Denoting that students do not have anxiety, aggressiveness and irritability, since the accessibility to mobile and network technologies, have not yet created dependence in students.

This research contributes to the understanding that technostress is conditioned by the level of use and frequency given by the student. And that this virtuality due to the mandatory quarantine leads to a greater use of technologies and warns that if there is no control by the family and teachers it can lead to higher levels of technostress and tensions at the physical, social and emotional levels.

This study was carried out in the context of Covid-19 and it is likely that distance education will continue to be extended in all educational systems, which implies that public policies should be created for the emotional well-being and physical activity of society. Within the future lines of research in the face of these needs, studies should be directed at knowing the attitudes that are generated among students who have a telephone and those who do not, as well as to investigate in depth the type of use they make of these mobile devices.

ACKNOWLEDGMENTS

To the Universidad Nacional de San Agustín de Arequipa for providing us with the knowledge and facilities to carry out the research, through continuous pre-professional internships and consulting support.

REFERENCES

[1] WHO. Questions and Answers on Coronavirus Disease (COVID-19) World Health Organization, retrieved March, 11 2020 from https://www.who.int/es/emergencies/diseases/novel-coronavirus-2019/advice-for-public/q-a-coronaviruses?gclid=Cj0KCQjwreT8BRDTARIsAJLI0KLVgbxijRRxJp0FATZuEkCao77iGpSNlFpKjOOwf_ECm8EZqk6y6U4aAnCDEALw_wcB

[2] Sir John Daniel. 2020. Education and the COVID-19 pandemic. PROSPECTS. Advance online publication 49 (April 2020), 91–96. https://doi.org/10.1007/s11125-020-09464-3

[3] Marialuz A. García-González, Fermín Torrano, and Guillermo García-González. 2020. Analysis of stress factors for female professors at online universities. International journal of environmental research and public health 17, 8 (April 2020), 2958. https://doi.org/10.3390/ijerph17082958

[4] Abdulrahman E. Al Lily, Abdelrahim F. Ismail, Fathi M. Abunasser and Rafdan H. Alqahtani. 2020. Distance education as a response to pandemics: Coronavirus and Arab culture. Technology in Society 63 (November 2020), 101317. https://doi.org/10.1016/j.techsoc.2020.101317

[5] Yao-Ting Sung, Kuo-En Chang and Tzu-Chien Liu. 2016. The effects of integrating mobile devices with teaching and learning on student learning performance: a meta-analysis and research synthesis. Computadoras y educación 94 (March 2016), 252-275. https://doi.org/10.1016/j.compedu.2015.11.008

[6] Kristof De Witte, Carla Haelermans and Nicky Rogge. 2015. The effectiveness of a computer-assisted math learning program. Journal of Computer Assisted Learning 31, 4 (August 2015), 314-329. https://doi.org/10.1111/jcal.12090

[7] Santa Dreimane. 2019. Gamification for education: Review of current publications. In: Daniela L. (eds) Didactics of Smart Pedagogy. Springer, Cham. 453-464. https://doi.org/10.1007/978-3-030-01551-0_23

[8] Nirupam Madaan, LaxmiTej Wundavalli and Sujata Satapathy. 2020. Techno stress among medical freshmen: An exploratory study. Journal of Education and Health Promotion 9, 1 (July 2020), 178. https://doi.org/10.4103/jehp.jehp_242_19

[9] Rui-Juan Yang, Jing-Yi Yang, Hao-Ran Yuan and Jun-Ting Li. 2017. Techno-stress of teachers: an empirical investigation from china. The Third International Conference on Education and Social Development, DE Stech publications, EE.UU. 603-608. https://doi.org/10.12783/dtssehs/icesd2017/11619

[10] Danilo M. Marchiori, Emerson W. Mainardes and Ricardo G. Rodrigues. 2018. Do individual characteristics influence the types of technostress reported by workers? International Journal of Human–Computer Interaction 35, 3 (March 2018), 218-230.https://doi.org/10.1080/10447318.2018.1449713

[11] Ahmet N. Çoklar, Erkan Efilti, Yusef L. Sahin and Arif Akçay. 2016. Investigation of Techno-Stress Levels of Teachers Who Were Included in Technology Integra-tion Processes. TOJET: The Turkish Online Journal of Educational Technology (November 2016), 1331-1339. https://eric.ed.gov/?id=ED575012

[12] Carla Estrada-Muñoz, Dante Castillo, Alejandro Vega-Muñoz and Joan Boada-Grau. 2020. Teacher Technostress in the Chilean School System. International Journal of Environmental Research and Public Health 17, 15 (July 2020), 5280. https://doi.org/10.3390/ijerph17155280

[13] Pooja Sareen. 2019. Techno Stress Creators-An Exploratory Research on Teaching and Non-Teaching Staff Working in Colleges. International Journal of Management and Humanities (IJMH) 3, 9 (May 2019), 1-7 https://www.ijmh.org/wp-content/uploads/papers/v3i9/I0241043919.pdf

[14] Rabindra K. Jena. 2015. Technostress in ICT enabled collaborative learning environment: An empirical study among Indian academician. Computers in Human Behavior 51 (October 2015), 1116-1123. https://doi.org/10.1016/j.chb.2015.03.020

[15] Ju J. Young, Kyu Y. Lim and Nam H. Kim. 2016. The effects of secondary teachers' technostress on the intention to use technology in South Korea. Computers & Education, 95 (April 2016), 114-122. https://doi.org/10.1016/j.compedu.2015.12.004

[16] Yan Dong, Chang Xu, Ching S. Chai and Xuesong Zhai. 2019. Exploring the Structural Relationship Among Teachers' Technostress, Technological Pedagogical Content Knowledge (TPACK), Computer Self-efficacy and School Support. The Asia-Pacific Education Researcher 29 (June 2019), 1-11. https://doi.org/10.1007/s40299-019-00461-5

[17] Lu Li and Xinghua Wang. 2020. Technostress inhibitors and creators and their impacts on university teachers' work performance in higher education. Cognition, Technology & Work (February 2020), 1-16. https://doi.org/10.1007/s10111-020-00625-0

[18] Cong Qi. 2019. A double-edged sword? Exploring the impact of students' academic usage of mobile devices on technostress and academic performance. Behaviour & Information Technology 38, 12 (February 2019), 1337-1354. https://doi.org/10.1080/0144929X.2019.1585476

[19] Joyce Gubbels, Nicole M. Swart and Margriet A. Groen. 2020. Everything in moderation: ICT and reading performance of Dutch 15-year-olds. Large-scale Assessments in Education 8, 1 (January 2020), 1. https://doi.org/10.1186/s40536-020-0079-0

[20] Tommaso Agasisti, María Gil-Izquierdo and Seong Won Han. 2020. ICT Use at home for school-related tasks: what is the effect on a student's achievement? Empirical evidence from OECD PISA data. Education Economics 28, 6 (September,2020) 1-20. https://doi.org/10.1080/09645292.2020.1822787

[21] Gloria Besoli, Núria Palomas and Andrés Chamarro. 2018. Uso del móvil en padres, niños y adolescentes: Creencias acerca de sus riesgos y beneficios. Aloma: Revista de Psicologia, Ciències de l'Educació i de l'Esport 36, 1 (April 2018), 29-39. https://doi.org/10.51698/aloma.2018.36.1.29-39

[22] Stephanie Chevalier. Peru: smartphone household penetration 2012-2019, Statista. retrieved January, 26 2021 from https://www.statista.com/statistics/802247/peru-smartphone-household-penetration/

[23] Jesús W. Huanca-Arohuanca; Felipe Supo-Condori; Reynaldo Sucari and Luis A. Supo. 2020. El problema social de la educación virtual universitaria en tiempos de pandemia, Perú. Innovaciones Educativas, 22, (October 1, 2020) 115-128. doi:https://doi.org/10.22458/ie.v22iEspecial.3218

[24] INEI. Estadísticas de las tecnologías de información y comunicación en los hogares. retrieved March, 26 2021 from https://www.inei.gob.pe/biblioteca-virtual/boletines/tecnologias-de-la-informaciontic/1/

[25] Honmy Rosario. 2007. Tic en el ambito educativo. TIC en Ambientes Educativos. Comunidad y Salud 5, 2 (December 2007) https://www.redalyc.org/articulo.oa?id=375740241001

[26] Mohammad Salehan and Arash Negahban. 2013. Social networking on smartphones: When mobile phones become addictive. Computers in Human Behavior 29, 6 (November 2013), 2632-2639. https://doi.org/10.1016/j.chb.2013.07.003

[27] Romulo D. Arévalo, Orlean Araujo and Sergio Bachicoria. 2019. Trend in the use of technology in university students from the canton El Carmen - Manabí. Revista Científica Sinapsis 1, 14 (September 2019). https://doi.org/10.37117/s.v1i14.193

[28] Gulshat Muhametjanova, Gülgün A. Adanir and Azat Akmatbekova. 2019. Internet and social networks use habits of adolescents between ages of 10-19 in the Kyrgyz Republic. Journal of Children and Media 14, 2 (October 2019), 1-14. https://doi.org/10.1080/17482798.2019.1684965

[29] Enrique Odriozola. 2012. Factores de riesgo y factores de protección en la adicción a las nuevas tecnologías y redes sociales en jóvenes y adolescentes. Revista española de drogodependencias 4 (December 2012), 435-48. https://dialnet.unirioja.es/servlet/articulo?codigo=4113810

[30] Virginia Jiménez, Jesús M. Alvarado and Carmen Llopis. 2017. Validación de un cuestionario diseñado para medir frecuencia y amplitud de uso de las TIC. Edutec. Revista electrónica de tecnología educativa 61 (December 2017), 368-368.https://doi.org/10.21556/edutec.2017.61.949

[31] Craig Brod. 1984. Technostress: The human cost of the computer revolution. Addison-Wesley, USA

[32] Veera Boonjinga and Pisit Chanvarasuthb. 2017. Risk of overusing mobile phones: Technostress effect. 8th International Conference on Advances in Information Technology, IAIT2016, China, 19-22. https://doi.org/10.1016/j.procs.2017.06.053

[33] Marisa Salanova. 2007. Nuevas tecnologías y nuevos riesgos psicosociales en el trabajo. 28 de abril: revista digital de seguridad y salud en el trabajo. http://rabida.uhu.es/dspace/handle/10272/3400

[34] TS Ragu-Nathan, Monideepa Tarafdar, Bhanu S. Ragu-Nathan and Qiang Tu. 2008. The consequences of technostress for end users in organizations: Conceptual development and empirical validation. Information systems research 19, 4 (August 2008), 417-433. https://doi.org/10.1287/isre.1070.0165

[35] Anna M. Fuglseth and Øystein Sørebø. 2014. The effects of technostress within the context of employee use of ICT. Computers in Human Behavior 40 (November 2014), 161-170. https://doi.org/10.1016/j.chb.2014.07.040

[36] Monideepa Tarafdar, Qiang Tu, Bhanu S. Ragu-Nathan y TS Ragu-Nathan. 2007. The Impact of Technostress on Role Stress and Productivity. Journal of management information systems 24, 1 (July 2007), 301-328. https://doi.org/10.2753/MIS0742-1222240109

[37] Markus Salo, Henri Pirkkalainen and Tiina Koskelainen. 2018. Technostress and social networking services: Explaining users' concentration, sleep, identity, and social relation problems. Info Systems J. 29,2 (August 2018), 408-435 https://doi.org/10.1111/isj.12213

[38] Norma Coppari, Laura Bagnoli, Gerónimo Codas, Heidi López, Úrsula Martínez, Larissa Martínez and Maureen Montanía. 2018. Validity and reliability of the Techno-stress Questionnaire on students from Asuncion. Perspectivas en Psicología 15, 2 (November 2018) 40-55. http://perspectivas.mdp.edu.ar/revista/index.php/pep/article/view/412

[39] Ana Díaz-Vicario, Cristina Mercader and Joaquín Gairín.2019. Uso problemático de las TIC en adolescentes. Revista electrónica de investigación educativa 21 (March 2019), 1-11. https://doi.org/10.24320/redie.2019.21.e07.1882

[40] Khodabakhsh Ahmadi and Abolfazl Saghafi. 2013. Psychosocial profile of Iranian adolescents' Internet addiction. Cyberpsychology, Behavior, and Social Networking 16, 7 (July 2013), 543-548. https://doi.org/10.1089/cyber.2012.0237

[41] Diana V. Nobles, León Londoño,Segundo Martínez, Arturo A. Ramos,Geidy P. Santa and Alba M. Cotes. 2016. Tecnologías de la comunicación y relaciones. Educación y Humanismo 18, 30 (January-June 2016), 14-27. http://dx.doi.org/10.17081/eduhum.18.30.1311

[42] Raija-Leena Punamäki, Marjut Wallenius, Clase-Håkan Nygård, Lea Saarni and Arja Rimpelä. 2007. Use of information and communication technology (ICT) and perceived health in adolescence: the role of sleeping habits and waking-time tiredness. Journal of adolescence 30, 4 (August 2007), 569-585. https://doi.org/10.1016/j.adolescence.2006.07.004

[43] Roberto Hernández-Sampieri and Christian P. Mendoza. 2018. Metodología de la Investigación Las Rutas Cuantitativa, Cualitativa Y Mixta. Mc Graw-Hill Interamericana Editores, Mexico

[44] Ramakrishna Ayyagari, Varun Grover and Russell Purvis. 2011. Technostress: technological antecedents and implications. MIS quarterly 35, 4 (December 2011). 831-858. https://doi.org/10.2307/41409963

[45] Yusuf L. Şahin and Ahmet N. Çoklar. 2009. Social networking users' views on technology and the determination of technostress levels. Procedia-Social and Behavioral Sciences 1, 1 (January 2009), 1437-1442. https://doi.org/10.1016/j.sbspro.2009.01.253

[46] Michelle M. Weil and Larry D. Rosen. 1997. Technostress: coping with technology @work, @home, @play, John Wiley & Son. New York, USA.

[47] Gila C. Zilka. 2020. Teenagers connected to digital environments – what happens when they get to school? Commonalities,similarities and differences from their perspective. Education and Information Technologies 25, 3 (May 2020), 1743 - 1758. https://doi.org/10.1007/s10639-019-10052-y

[48] Alma L. Sapién, Laura C. Piñon, Maria del Carmen Gutiérrez and José L. Bordas. 2020. Higher Education during the health contingency COVID-19: Use of ICTs as learning tools. Case study: students of the Faculty of Accounting and Administration. Revista Latina de Comunicación Social 78, (October 2020), 309-328. https://doi.org/10.4185/RLCS-2020-1479

[49] Hamood Al-Huneini, Aisha Walker and Richard Badger. 2019. Introducing tablet computers to a rural primary school: An Activity Theory case study. Computers & Education 143 (January 2019), 103648. https://doi.org/10.1016/j.compedu.2019.103648

[50] Sudhir S. Kaware and Sunil K. Sain. 2015. ICT Application in Education: An Overview. International Journal of Multidisciplinary Approach and studies, 2,1 (February 2015), 25-32. http://ijmas.com/upcomingissue/04.01.2015.pdf

[51] Pallavi Upadhyaya and Vrinda. 2020. Impact of technostress on academic productivity of university students. Educ Inf Technol Education and Information Technologies (September 2020), 1-18. https://doi.org/10.1007/s10639-020-10319-9

[52] Hasret Aktaş and Nurcan Yılmaz. 2017. Smartphone addiction in terms of the elements of loneliness and shyness of university youth. International Journal of Social Sciences and Education Research 3, 1 (December 2017) 85-100. https://www.guvenliweb.org.tr/dosya/HMsOu.pdf

[53] Juan-Carlos Torres-Díaz, Josep-M Duart, Héctor-F. Gómez-Alvarado, Isidro Marín-Gutiérrez and Verónica Segarra-Faggioni. 2016. Internet Use and Academic Success in University Students. Comunicar XXIV, 48 (julio de 2016), 61-70. https://doi.org/10.3916/C48-2016-06

[54] Sang-Joon Lee, Soo-Hyang Jin and Beom-Jin Choi. 2012. The Influence of Technostress and Antismart on Continuous Use of Smartphones. In Proceedings of the world congress on engineering and computer science, 1(October 2012), 24-26. http://www.iaeng.org/publication/WCECS2012/WCECS2012_pp303-308.pdf

[55] Wei-His Hung, Li-Min Chang and Chien-Hung Lin. 2011. Managing The Risk of Overusing Mobile Phones in The Working Environment: A Study Of Ubiquitous Technostress. In PACIS Proceedings 81. https://aisel.aisnet.org/pacis2011/81/