Technostress and Quality of Life in Graduate Students at a University in Southern Sonora

Dennise Yolanda Hernández Valenzuela[1], Lizeth Armenta Zazueta[2*], Celia Yaneth Quiroz Campas[3], Domingo Enrique Ibarra Meza[4], María Elena Pacheco Olguín[5]

[1]Instituto Tecnológico de Sonora, Unidad Navojoa, Sonora, México
[2]Instituto Tecnológico de Sonora, Unidad Navojoa, Sonora, México
[3]Instituto Tecnológico de Sonora, Unidad Navojoa, Sonora, México
[4]Instituto Tecnológico de Sonora, Sonora, México
[5]Instituto Tecnológico de Sonora, Sonora, México

Summary
This research analyzes and determines the level of technostress in graduate students of a university in Sonora, Mexico, and its effect on their quality of life. Technostress arises from the excessive use of technologies (ICTs), generating anxiety, exhaustion and frustration due to the constant demand for digital skills. Although ICTs facilitate learning and communication, their abuse can lead to addiction, affecting physical and mental health, as well as interpersonal relationships. The study applied a validated questionnaire to 40 students, revealing that most of them have technological dependence, with high levels of anxiety when disconnecting, distraction in academic activities and a preference for digital communication over face-to-face communication. In addition, many incur debt to acquire upgraded devices. The results show that technostress alters essential habits such as sleep and eating, deteriorates social skills and increases isolation. It is concluded that medium-high technostress significantly reduces quality of life, affecting academic performance, emotional health, and personal relationships. It is recommended to promote a balanced use of technology, digital disconnection strategies and educational programs to promote healthy technological habits. The study highlights the need to address this emerging issue to improve student well-being in an increasingly digitized world.
Keywords: Technostress, ICT, Digital Skills.

INTRODUCTION

This research shows a study that refers to the level of technostress suffered by graduate students of a university in southern Sonora and how this influences the quality of life of those who suffer from it, according to Cruz and Aguilar (2022), the phenomenon of technostress is a consequence of the excessive use of Information and Communication Technologies (ICT) that potentially drive distress in workers in various work environments. As a result of a demand for high digital skills to carry out daily activities, this constant demand can generate feelings of incompetence, frustration and mental exhaustion, which increases the feeling of technostress. For Hernández et al. (2022), technostress occurs in all those people who interact daily with technology, and the teaching-learning process, and is amplified when classes are supported by the use of technological didactic resources.

This phenomenon is relevant in the educational field, since its influence not only affects the pedagogical processes that determine the level of learning of students, but also factors that influence the quality of life of those who suffer from it (Hernández et al., 2022). According to Bairero (2017), quality of life is a set of conditions that allow the physical and psychological well-being of human beings to be maintained or modified, with the aim of obtaining a relationship of comfort in their life in general. It is not common to relate the use of ICTs with negative aspects, since their use and design have made academic activities automated and simpler, however, having so many benefits and facilities can sometimes be addictive and generate both physical and mental health problems. Therefore, it is important to know the level of technostress of students and its relationship with quality of life (Coppari, 2018).

Research indicates that technostress negatively affects the emotional and physical health of those who suffer from it, generating symptoms such as anxiety, irritability, chronic fatigue, muscle pain, and sleep disorders (Lazcano, 2023). For Hernández (2021), in the long term, technostress not only affects the quality of life of individuals, but can also contribute to more serious health problems, such as psychological disorders or diseases related to physical and mental exhaustion, such as burnout syndrome. Although a low or even medium level of technostress can relate or indicate that students maintain a good quality of life, it is essential to recognize that a high level of technostress can affect or generate physical-mental ailments and even affect the economic situation due to the acquisition of the latest technology. Knowing these consequences is essential to promote the responsible use of ICTs.

Likewise, it is essential to consider ICT as tools that facilitate work and learning, it is undeniable that students obtain benefits from their use, including the possibility of accessing a vast amount of information and improving communication with their teachers and classmates. Currently, according to data from the Economista (2024), most of the population has access to the internet, and to a wide variety of technological devices, such as the use of computers, tablets, smartphones among other technological devices that have boosted the well-being and progress of human beings. However, despite its advantages, the excessive use of electronic devices, inexperience, and the multitude of platforms, together with constant changes and updates, can generate significant negative effects on students' well-being, which can become a potential source of stress (Cordero, 2020).

In the education sector, there is no doubt that new technologies have become great allies of Higher Education Institutions (HEIs), Cárdenas and Bracho (2020) mention that they facilitate the teaching of classes, and administrative activities in general, optimizing resources and time. However, special attention must be paid to the implementation of these new technological tools, since if used incorrectly it could generate negative consequences for students and staff incorporated into HEIs. For his part, Carrión (2022) points out that the inclusion of ICTs and their constant use caused teachers and students to readjust their lifestyles by incorporating activities that resulted in emotional and mental health effects such as depression and anxiety.

Along the same lines, other consequences detected by the excessive use of ICT and technostress suggested by Cuervo et al. (2017), are anxiety and tension in employees, excessive fatigue and low work motivation. For their part, Hernández et al. (2021) point out that, in their findings, the results were consistent with those found by Penado et al.

(2022), where students pointed out that the transition between traditional or remote-virtual teaching methods generated a high level of mental stress towards ICT in them.
A study by Coppari et al. (2018) concluded that more than 50% of participants used ICTs for more than five hours a day, especially in communication, learning, and non-productive activities, in that order. The report indicated a weak positive correlation between technostress and two of the three factors linked to the use of ICTs specifically in relation to communication and learning activities. This correlation suggests that, although the extensive use of ICTs could be linked to an increase in stress levels, the nature of the activities carried out does not always generate a significant negative impact on the well-being of individuals. For their part, Sánchez et al. (2021), evaluated 2 populations of undergraduate students, in one it was possible to identify that stress levels are low, while the other reported levels with a high tendency, in addition to presenting a bad attitude towards the use of ICTs, in terms of addiction, they are directly causally related to technostress, in conclusion, it is essential to recognize the potential of ICT and the positive and negative effects that can occur in teachers and students.
In this way, technostress becomes a direct reflection of the environment, current demands and the lack of skills for the correct use of electronic devices. This phenomenon has a different degree of affectation in those people who suffer from it, which can be determined according to exposure to ICTs. For example, a low level of technostress could be considered digital well-being. According to Quintana (2021), the individual maintains a healthy balance between the use of ICT and their daily responsibilities, manages their time online responsibly, which ensures that their study, work, and essential functions activities are not significantly affected, which allows them to cultivate strong interpersonal relationships and maintains a positive relationship with technology, avoiding falling into negative emotional states derived from the excessive use of devices. Similarly, the medium level of technostress describes a person who occasionally experiences interruptions in their daily activities due to the use of technological devices, although they fulfill their responsibilities, at times they can be distracted, which slightly affects their concentration and productivity, although on certain occasions they may present a temporary disconnection maintains interpersonal relationships. in some cases, they manifest mild symptoms of technostress, but manage them effectively without significantly affecting their general well-being (Coppari et al., 2017).
Along the same lines, Ucharico et al. (2024) mention that within the level of high technostress, all those subjects who face constant interruptions in their daily activities due to the excessive use of technological devices are identified, which negatively impacts their academic and work performance and their physical-emotional well-being, they also experience a notable disconnection in their interpersonal relationships and may present alterations in essential patterns such as the sleep, diet and physical activity, derived from an excessive dependence on technology.
According to a research carried out at the UMA University in Mexico to 352 undergraduate students, it found that the health variable in the last twelve months obtained 69.6% where the surveyed students mention that their quality of life is good while 16% mention that it is worse compared to the quality of life they led in the previous year (Lara et al., 2015). For their part, Medina, et al. (2022) mentions that, in a private university in Jalisco, it was found that the career and nationality to which they belong has a great influence on the quality of life of students, 44% of the surveyed population

mentions that their quality of life is regular, while only 14% indicated that their quality of life is good.

Considering the above, we can understand that technostress can manifest itself according to its degree of affectation or suffering at different levels, which position people who suffer from it in situations that directly affect factors of their quality of life. In all these situations, measuring the level of technostress and quality of life is elementary because it is considered the most relevant indicator and with the greatest participation in all stages of an individual's life, in Mexico the factors for measuring the level of quality of life are between the level of income, health, balance between work and personal-family activities.

METHOD

The present research allows us to analyze the level of technostress suffered by graduate students of a university in southern Sonora and how it affects their quality of life, through the application of a reliable and validated instrument, which allows identifying the key factors that determine the levels of technostress.

Participants

The participants of this research were postgraduate students of the Master's Degree in Education, from a university in the South of the state of Sonora. Access to students was through academic coordination, and 100 percent of the population was considered, using non-probabilistic sampling for convenience, which facilitates the selection of participants for the study in a direct, efficient, and representative manner (Hernández, 2021). The application of the form was carried out when the students who make up the 2023-2025 and 2024-2026 generation were studying tetramestres IV and I respectively, with the age range between 23 and 46 years old, between female and male.

Instrument

For the purposes of this study, the Technostress Behavior Questionnaire, developed by Coppari et al. (2018), was used, which has demonstrated a high reliability index with a Cronbach's alpha coefficient $\alpha = .90$, indicating satisfactory internal consistency. This instrument aims to assess the negative impact of the excessive use of ICT in various areas, such as studies, work and social relationships, including areas such as family, friends and partner, as well as vital functions and health, including mood and emotions. The instrument consisted of 40 items, which are distributed in the different dimensions that make up the questionnaire. The first dimension is called sociodemographic data collects academic and work information of the participants (5 items), the second dimension is called stress level represents all those needs that participants present to stay connected to social networks and the use of ICTs (9 items), for the third dimension called technostress evaluates the use of ICT while performing vital functions such as eating and sleeping (12 items), finally, the quality of life dimension focused on analyzing the level of impact on emotions and social relationships (14 items). The answers are established using a 3-point Likert scale, where 3 = Always, 2 = Infrequent, and 1 = Never (see table 1).

Procedure

To carry out a research, it must be organized in a logical and orderly way to guarantee rigor and effectiveness in the study. As a first step, it is necessary to define and delimit the research problem. A detailed review of the available literature is then conducted to understand the context and current state of knowledge on the topic. Subsequently, a precise hypothesis or research question is formulated. Then, the most appropriate methodological design (quantitative, qualitative or mixed) is chosen and the appropriate tools to collect the data are selected. Once the methodology has been defined, the information is collected according to the established methods. Finally, the results obtained are analyzed and interpreted to develop the corresponding conclusions and recommendations (Espinoza, 2019).

The steps to carry out this study were as follows:

Step 1. The decision was made on the name of the topic and began to document it, in addition to detecting the problem statement.

Step 2. A literature review was carried out and chapters I and II were prepared.

Step 3. Chapter 3 was developed and the evaluation instrument was applied with the support of the educational program.

Step 4. We worked with the database resulting from the instrument applied in step 3, all this using the SPSS version 4 statistical package.

Step 5. Chapters 4 and 5 were developed with the information obtained in step 4.

RESULTS

This section shows the results obtained from the application of the instrument, where a total of 40 graduate students participated, of which 14 are male and 26 female. They range from 23 to 46 years of age, with 46% being in the 20-30 age range. Likewise, 21 students were studying Tetramestre IV, while 19 were studying Tetramestre I. 77.5% work and 22.5% are only dedicated to studying, information obtained in the dimension of sociodemographic data that correspond to items 1,2,3,4,5.

In this sense, Table 3 shows data related to the third dimension called technostress, and is made up of the items (7, 8, 10, 11, 17, 26, 27, 30, 31, 32, 33). Participants were asked: Do you feel safer to disqualify, annoy or attack third parties when you are online than when you are face to face, to which 82.5% responded that they recognize feeling safer to disqualify or attack online. Likewise, items 31 and 32 show that approximately 70% of the surveyed population feels the need to share information on a daily basis and is concerned about the number of approvals that their publications obtain on social networks. Along the same lines, in item 33 the result of the mean is high with a value of 2.50, which indicates that the respondents have a general preference for digital communication.

Table 3 *Technostress Dimension*

Item	Utterance	Always	Rare	Never	Stocking
7	You need to stay connected and keep an eye on social media updates.	15%	65%	20%	1.95
8	You constantly look at your cell phone to check 1 you have received messages.	5%	55%	40%	1.65

10	You consider it appropriate to interact with other people through ICTs (cell phones, networks, etc.) when dealing with intimate, personal, private issues.	42.50%	35%	22.50%	2.20
11	You need to be connected most of the day to the Internet.	12.50%	45%	42.50%	1.70
17	You feel more confident to disqualify, annoy, or attack others when you're online than when you're face-to-face.	82.50%	12.50%	5%	2.78
26	You use your cell phone while you eat.	15%	75%	10%	2.05
27	You use your cell phone in the bathroom.	37.50%	35%	27.50%	2.10
30	You are aware of your cell phone when you go out or when you are with your partner.	27.50%	67.50%	5%	2.23
31	You feel like you need to share information about your opinions, affections and activities daily through social networks.	70%	27.50%	2.50%	2.68
32	You care about and affect the number of approvals ("likes", "rt", "fav") when you post images, videos or comments on social media.	72.50%	22.50%	5%	2.68
33	You feel that it is easier and you prefer to communicate with other people through cell phones or the Internet than to do it face-to-face.	55%	40%	5%	2.50

Along the same lines, the quality of life dimension formed by the items (6, 15, 16, 18, 20, 22, 24, 28, 34, 35, 35, 37, 38, 39 and 40) was evaluated, where all of them obtained a high result, the mean shows that all the items are above 2.0, the statement 35, You have experienced anxiety, Aggressiveness or intolerance When the control of third parties (family, bosses, teachers, partner, etc.) prevented you from connecting, the participants always responded with 82.5%, in the same order of ideas, when evaluating item 22, Do you think that you could not live or be happy if you deprive yourself or are deprived of being connected, even for a short time, the participants responded, always with 87.5%. On the other hand, statements 36 and 40 obtained 77.5% and 85%, respectively, as the maximum value of their always option, these 4 items being the highest in the dimension and coinciding with 0% in their option of never as a response to the statement (see table 4).

The results obtained from item 15, where they were asked about, You need to have and you get into debt to acquire the latest technological advances (latest model of cell phone, smartphone, tablet, laptop, etc.) show that 85% of respondents responded that they always acquire debt to keep devices updated while only 2.5% thought never. This was followed by items 38 and 36, which show a high mean of 2.73 and 2.78, respectively (see Table 4).

Table 4*Quality of Life Dimension*

Item	Utterance	Always	Rare	Never	Media
6	You interrupt your activities in class or study due to the use of your cell phone, tablet, iPod, Smartphone (ICT)	25.0%	55.0%	20.0%	2.05
15	You need to have and you get into debt to acquire the latest technological advances (latest model of cell phone, Smartphone, tablet, laptop, etc.)	85.0%	12.5%	2.5%	2.83
16	You change or fake aspects of your personality or moods when interacting with third parties on social media.	82.5%	12.5%	5.0%	2.78
18	You have been reproached for lack of attention or mistakes in studies/work, for being connected.	77.5%	20.0%	5.0%	2.75
20	At a family/social gathering, you prefer to be connected for entertainment rather than face-to-face contact and communication with others and indeed you do.	57.5%	40.0%	2.5%	2.55
22	You think that you could not live or be happy if you deprive yourself or are deprived of being connected, even for a short time.	87.5%	12.5%	0.0%	2.88
24	You get easily irritated when they take a long time to answer your messages, "like" your photos, videos or others.	65.0%	30.0%	5.0%	2.25
28	You have stayed up late to connect (to a computer, cell phone, etc.) and you wake up tired and irritable.	32.5%	60.0%	7.5%	2.60
34	You neglect activities (study, work, social) that prevent you from being connected.	72.5%	25.0%	2.5%	2.70
35	You have experienced anxiety, aggression or intolerance when the control of third parties (family, bosses, teachers, partner, etc.) prevented you from connecting.	82.5%	17.2%	0.0%	2.83
36	You have distanced yourself from friends, family, partner because you prefer to connect to play online, or download content for fun.	77.5%	22.5%	0.0%	2.78
37	You have lost the ability to speak or interact face-to-face with your family, partner, friends, etc.	85.0%	12.5%	2.5%	2.83
38	You have been complained about by those close to you (family, partner, friends) because you isolate yourself and prefer to connect and talk to them.	75.0%	22.5%	2.5%	2.73

39	You have preferred to end an emotional or work relationship, through cell phone, messaging, networks, than doing it in person.	72.5%	20.0%	7.5%	2.65
40	You lost vocabulary when you speak or write because of the frequent use of abbreviations on cell phones or networks.	85.0%	15.0%	0.0%	2.85

CONCLUSIONS

The objective of this study was to analyze the level of technostress and its influence on the quality of life of graduate students of a university in southern Sonora. Therefore, relevant information is presented on the effects that the phenomenon of technostress can generate in various areas of the lives of graduate students. The findings obtained in the dimensions analyzed show a clear trend towards technological dependence, the levels of technostress coincide with the study by Hernández et al. (2022) and Quispe et al. (2024) where the evidence indicates a level of technostress between medium and high, which causes negative consequences that affect the individual appearance and interpersonal relationships of those who suffer from it.

The results indicate that a large number of students are subjected to indebtedness to acquire updated technological devices, which favor the interruption of their activities and confront them with difficulties in disconnecting from social networks, affecting their concentration and productivity. This constant distraction not only harms their academic and social performance, but also increases dependence on mobile devices and generates anxiety when they are not connected, which is related to a loss of self-control in the use of technology. These data coincide with studies by Solano and Núñez (2025), which among their most relevant findings mentions that most students showed a strong relationship between technostress and the use of technological devices in their academic and personal activities, suggesting that the frequent use of this device could be contributing to the development of stress associated with technology.

In addition, the impact of the excessive use of technologies on students' family and personal relationships is highlighted. Interactions through social networks, in many cases, distort personality and encourage more aggressive behaviors that are not manifested in face-to-face interactions. This phenomenon suggests a progressive distancing of students from their immediate environment, which can reduce the quality of their social and family relationships (Troya et al., 2023). In terms of vital functions, the use of ICTs has invaded daily activities such as eating and resting, affecting healthy habits. In this sense, the excessive use of abbreviations and emoticons, whose prevalence has experienced a notable increase in recent years, is negatively affecting healthy communication habits (Hidalgo, 2023). This phenomenon generates detrimental variables that directly impact the development of language skills and the ability to express themselves in writing.

This deterioration in vital functions, linked to the need to be constantly connected, reinforces the idea that technostress is associated with alterations in the rhythms of life of graduate students. The emotional effects of constant connectivity are manifested in high levels of anxiety, stress, and social isolation (Hernández et al., 2022). The tendency of students to prioritize virtual interactions over face-to-face relationships increases emotional distress, makes it difficult to properly manage emotions, and contributes to a decrease in psychological well-being.

The excessive use of technology and the repercussions it causes on the emotional, social and work lives of respondents is worrying and significant. Overall, the results of this study highlight the need to promote a more conscious and balanced use of digital platforms and electronic devices (Rojí 2024), underlining the importance of addressing technological dependence as an emerging problem in today's society, which requires attention both individually and collectively. This coincides with the studies of Puma and Calcina (2024), who indicate that only through a comprehensive approach that promotes digital well-being can the negative impact of the excessive use of ICTs be counteracted and a healthier and more productive relationship with technology fostered.

While technology offers numerous benefits, its excessive and uncontrolled use can have negative consequences on mental health, interpersonal relationships, and overall quality of life. Studies show that postgraduate students have a medium-high level of technostress, which, according to Quispe et al. (2024), has a direct impact on their quality of life.

Therefore, it is concluded that graduate students who suffer from a medium-high level of technostress present negative conditions or situations that reduce their quality of life aspects such as face-to-face interaction, communication, indebtedness to acquire more up-to-date technological devices, among others. It is suggested that this study be followed up and include strategies that support the reduction of this condition. Likewise, it is recommended to promote face-to-face communication, time management, and digital disconnection skills to mitigate these effects (Sánchez et al., 2021). In addition to this, the implementation of leisure and time optimization programs is suggested, as well as educational and awareness programs that help users develop healthier technological habits and recover the balance between digital and real life, in order to avoid a corrective situation and that their academic performance achieves the optimal for the achievement of personal and professional success.

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