

## Assessment of Teachers' Technostress in the Digital Workplace

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**Abstract:** *In the outbreak of the COVID-19 pandemic, the use of technology surged as an available tool in adapting to the changes in the educational system. While technology became an avenue for the continuation of education, it also paved the emergence of technostress in the teaching profession. Technostress pertains to stress induced by the widespread utilization of Information and Communication Technology (ICT) in the current set-up of education. Thus, this descriptive study aimed to assess the level of technostress of senior high school teachers at the University of the Cordilleras as a basis for identifying effective ways to manage the phenomenon under study. Furthermore, it sought to determine the impact of sociodemographic variables on the level of technostress of teachers who were selected via total enumeration (n=75). Data were gathered through an online survey questionnaire. The collected data were statistically examined through mean, percentage, and Independent T-test. Prior to this, normality was established through Shapiro – Wilk Test and Levene's Test. This study revealed that teachers experience a high level of technostress in the digital workplace. Furthermore, it showed that sociodemographic variables like age, educational attainment, marital status, and sex significantly influence the level of teachers' technostress. This implies that these variables must be taken into account when designing technostress management strategies for the improvement of teachers' overall well-being. Finally, it is recommended that a larger sample size, similar sociodemographic characteristics, and other quantitative methods may be considered for future research endeavors.*

**Keywords:** *Coronavirus, Digital workplace, Online education, Sociodemographic variables, Technostress*

### I. INTRODUCTION

The advent of the coronavirus instantly transformed the traditional working environment into a digital workplace. In the field of teaching, online education became a learning modality that required the use of different technologies in various ways such as teleconferencing, video-conferencing, e-books, online database, online discussions, and virtual platforms. The study of Reimers (2020) showed that employing educational technology tools to improve the relationship between teachers and students in terms of communication and interactive learning, as well as finding and sharing knowledge, has a high level of efficacy in the current coronavirus pandemic. From this, technology is undeniably a helpful tool not only for students but for teachers as well.

Indeed, technology plays a critical role that has a significant impact in a variety of fields, most notably in education, where technology aims to improve the quality of learning and instruction. Raja and Nagasubramani (2018) imparted that technology is used as part of the curriculum, as an instructional delivery method, as a means of assisting with instructions, and as a tool to improve the overall learning process. As a tool in the learning process, technology positively enhanced student motivation, student engagement, student collaboration, and hands-on learning opportunities, allows for learning at all levels, increases confidence in

students, and improved technology skills (Costley, 2014). Rahman (2014) supplemented that computers and related technologies helped attain the goals of distance learning delivery, implementation of online examination and monitoring, and computer-aided learning.

However, Tukan (2020) identified different challenges encountered by teachers in the online classroom during the pandemic such as operating the application during online discussion. It is challenging for teachers to motivate themselves and their students. In addition, most of the teachers are familiar with the application, but some of the others still have difficulty with it. Teachers are also challenged in developing the material for teaching, including the assessment, and evaluation tools. Likewise, developing the teaching method for online teaching presents a problem for teachers. Finally, teachers have difficulty integrating the material and technology into teaching effectively. These experiences are manifestations of the presence of technostress among teachers in an online learning scenario.

According to psychologist Craig Brod, technostress is a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner (Chiappetta, 2017). La Torre et al., (2020) supplemented that technostress is a new phenomenon that has resulted from the widespread usage of technology in the current digital age. In other words, technostress is the difficulty of individuals to deal with technology-related demands in the environment (Shirish, 2021). In view of technostress, individuals who use technology are called techno users. Zielonka and Rothlauf (2021) categorized technostress into two components, techno-eustress and techno-distress. The term techno-eustress embodies positive stress while techno-distress represents the negative stress that techno users face in the utilization of technology. In addition, Marchiori et al. (2018) and Christian et al. (2020) classified the different creators of technostress which include techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty.

Techno-overload is a state where users are forced to work faster and longer because of technology. Meanwhile, techno-invasion refers to a condition in which people feel compelled to be continually linked to technology, regardless of place and time. Another source of technostress is techno-complexity which is a condition in which teachers are forced to invest resources in learning and comprehending how to use new applications and updating their abilities as a result of complex technology. Furthermore, techno-insecurity refers to situations in which people feel threatened by those who have access to more advanced equipment and technologies. Finally, techno-uncertainty arises when the teachers feel uneasy about the frequent upgrades in ICT, constant changes to its functionalities, and replacing one ICT with another.

The concept of technostress is linked with the Transactional Theory of Stress and Coping that was developed by Richard S. Lazarus and Susan Folkman in 1985. According to Tarafdar et al. (2019), the theory explains the dynamic interaction of evaluation and coping processes when confronted with a situation in which the demands of the environment are greater than the individuals' capacities to deal with them. In line with this study, the primary appraisal occurs when the teacher as a techno user perceives the use of technology as either a challenge (techno-eustress) or a threat (techno-distress). From this stage, if the teacher appraised the situation as a threat to the teacher's well-being and overall performance, secondary appraisal takes place where coping responses are assessed to possibly manage the techno stressors. The outcomes will then be dependent on the coping strategies employed by teachers when dealing with technostress. When the coping strategies are not effective, technostress may not be addressed that may result to undesirable outcomes.

Thus, this study generally aimed to measure the technostress level of teachers as the traditional classroom suddenly shifts to a new learning environment. Specifically, it sought to determine the influence of sociodemographic characteristics specifically age, sex, educational

attainment, and marital status on the level of technostress experienced by teachers in the new normal.

## II. RELATED LITERATURE

Technostress has been recognized as a common concern among teachers even before the pandemic. In 2016, Coklar investigated the technostress level of teachers in terms of gender, professional length of service, and frequency of internet use. The study discovered that the teacher respondents have a medium level of technostress since there has been an intensive ICT investment in the last two decades. Another important result of the research is that gender and professional length of service of the teacher respondents did not affect their technostress at a significant level (Coklar, 2016). However, Coklar noted that teachers who use the internet longer reported a higher level of technostress compared to those who utilize the internet for a shorter period.

A corresponding study was conducted by Okonoda et al. (2017) in Nigeria. The respondents who are University staff showed a moderate level of technostress. The researchers also determined the influence of different variables on the level of technostress. Results of the study revealed that the higher the years of working experience indicates a higher level of technostress. On the other hand, the study concluded that age, gender, number of hours spent per day on a technological device, attendance of technology-related training, and years of computer gadget use do not have a significant influence on the technostress level of the respondents.

As the education system shifts to adapt to the inclusion of technology in the teaching and learning process due to the current health crisis, research showed the prevalence of technostress among teachers in the new normal. In Palestine, Mokh et al. (2020) examined the effect of online learning on the technostress of language teachers during the pandemic. The study revealed that online learning moderately affected the respondents' level of technostress. This result is of considerable concern because of a chance that the technostress level can increase over some time. The study also found out that variables including gender, length of service, and level of education of teachers do not differentiate their level of technostress. This means that regardless of these factors, the teachers experience the same level of technostress in conducting online learning.

A similar endeavor was conducted by Penado Abilleira et al. (2021) which determined the level of technostress of University teachers when carrying out their teaching tasks during the period of confinement caused by the COVID-19 pandemic in Spain. The researchers discovered older teachers who hold a position in the field suffered the most from the negative consequences of technology. Also, female teachers are more susceptible to technostress compared to their male counterparts. This implies that teachers' level of technostress differs in terms of age and gender.

In a further review, female teachers are indeed prone to technostress which is consistent with the research findings of Estrada-Muñoz et al. (2021). The study measured the levels of technostress in primary and secondary education teachers in Chile as schools opted to adopt teleworking as means of instruction. Results revealed that female teachers are more prone to technostress than male teachers in Chile. Technostress is also evident among staff members of Menoufia University in Egypt who are working in a remote virtual environment. In this study, Gabr et al. (2021) conveyed moderate to high levels of technostress among the teachers in the sample. The researchers further claimed that high levels of technostress were significantly influenced by age, higher professions, gender, and a bad workplace environment.

Similarly, different educational institutions in India depended on technology as a result of the current situation. For this reason, Rahaman and Yadav (2021) conducted a study to determine the technostress of teachers in higher education. The study also evaluated the inhibitors like literacy facilitation, technical support provision, and involvement facilitation that could minimize the negative effects of technostress creators which include techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. The authors revealed that the inhibitors showed a minimal contribution to reducing the teachers' technostress. Moreover, age is the only socio-demographic variable that differentiates the level of technostress. The teachers in the study experience the same level of technostress regardless of gender, designation, subject stream, and teaching experience.

Technostress has indeed materialized globally together with the widespread of the novel coronavirus. In Indonesia, Christian et al. (2020) measured the influence of different technostress creators on the teaching performance of lecturers in the province of Jakarta. The study disclosed that among the technostress creators, techno-complexity is the only factor that affects teachers' performance. This shows that teachers are experiencing difficulty to cope with the utilization of technology in their teaching methods to be conducted online. On the other hand, Hassan et al. (2019) examined the influence of technostress creators on the organizational commitment of teachers in Malaysia. The study indicated that techno-uncertainty and techno-insecurity significantly predict the commitment of teachers in their organization.

In the Philippines, technostress is given less attention in this time of the pandemic. In addition, studies about technostress are limited to librarians and staff in the call center industry. For instance, Laspinas (2015) focused on identifying the technostress of professional librarians who enrolled in a Master of Library and Information Science Program at Cebu Normal University. The study indicated that the librarians in the sample slightly experienced technostress. Another study by Ken et al. (2016) investigated the technostress of call center staff in the country. The study showed that a significant difference exists in the technostress levels of male and female staff. Along with this finding, the study found that the respondents experience a comparable degree of technostress in terms of age, marital status, and position.

### III. METHODOLOGY

#### **Research Design and Methodology**

This study employed a quantitative-descriptive research design as it intends to examine technostress which is an emerging phenomenon in the current pandemic. This endeavored to quantitatively measure the technostress level of teachers that will become a basis for future relevant work.

#### **Population and Locale**

The respondents of this study are senior high school teachers at the University of the Cordilleras, Philippines who were selected via total enumeration (n=75). All teachers in the sample of this study experienced teaching during the post-pandemic period and are teaching in an online setup during the health crisis.

#### **Data Gathering Instrument**

The researcher used a questionnaire to attain the objectives of this study. The items in the questionnaire were directly lifted from the work of Okonoda (2017). The questionnaire has a reliability coefficient greater than 0.75 indicating that the research instrument is acceptable for utilization. The first part of the questionnaire seeks to identify the teachers' demographic

profiles such as age, sex, educational attainment, and marital status. The second part is composed of 10 items that intend to measure the level of technostress. For the latter section, the respondents were asked to indicate their perceived extent of agreement on each statement through a 5-point Likert scale where one indicates a very low level of technostress and five denotes a very high technostress level.

### Data Gathering Procedure

The researcher asked permission from J-Lyn C. Espiritu, the Principal of the University of the Cordilleras – Senior High School Department to conduct the study. After the approval, the researcher scheduled a video conference to meet the respondents and explain the purpose of the research. Then, the questionnaires were administered to teachers through an online platform due to restrictions brought by the pandemic. After retrieving the necessary information, data were organized, analyzed, and interpreted to attain the objectives of this endeavor.

### Data Analysis

The data gathered were subjected to normality testing using Shapiro – Wilk Test and test for homogeneity of variances using Levene’s Test. After the normality of the distribution of data was established, the researcher employed a parametric test called T-Test for Two Independent Samples to compare the technostress level based on the teachers’ sociodemographic characteristics.

In addition, percentage was used to present the distribution of the respondents while mean measured the technostress level.

Table 1 was used as a guide for analysis and interpretation.

**Table 1**  
**Statistical Limit**

<b>Point</b>	<b>Mean Range</b>	<b>Descriptive Equivalence</b>	
5	4.16-5.00	Very High	VH
4	3.37-4.15	High	H
3	2.58-3.36	Moderate	M
2	1.79-2.57	Low	L
1	1.00-1.78	Very Low	LH

## IV. RESULTS AND DISCUSSION

Table 2 provides information about the demographic profiles of the respondents of this study. As shown, 75 respondents answered the online survey questionnaire. Out of the total respondents, 44 are young adults whose age range is from 23 – 30 (58.67%) while 31 are middle-aged adults in the age group 31 – 45 (41.33%). Most of the respondents are taking their post-graduate studies (64%) whereas 36% are Bachelor’s degree holders. Aside from this, the table shows that 60% of the respondents are single while 30% are married. Finally, the majority of the respondents are female teachers as indicated by a percentage value of 72% while male respondents have a percentage value of 28%.

**Table 2**  
**Sociodemographic Characteristics of Teachers**

Variables	N	%
<b>Age</b>		
Young Adult (23 – 30)	44	58.67
Middle-aged Adult (31 – 45)	31	41.33
<i>Total</i>	75	100
<b>Educational Attainment</b>		
College Graduate	27	36
Post Graduate Level	48	64
<i>Total</i>	75	100
<b>Marital Status</b>		
Single	45	60
Married	30	30
<i>Total</i>	75	100
<b>Sex</b>		
Male	21	28
Female	54	72
<i>Total</i>	75	100

Table 3 shows the teachers' level of technostress when working remotely. It can be noted that teachers have a moderate level of technostress when dealing with constant changes in computer software and hardware in their place of work. This shows that they are able to cope with techno-uncertainty. However, the overall mean of 3.46 reveals that teachers have a high level of technostress. This implies that teachers appear to be struggling when working in an online learning environment due to the sudden migration from traditional to online teaching. This is evident in the work of Mahwish Zeeshan et al., (2020) where online teaching is viewed by teachers as a new concept and has led to multiple experiments during the transition phase in the onset of the COVID-19 pandemic. The researchers further stated that this setup contributed significantly to teachers' level of technostress.

This situation can be attributed to teachers' Technological, Pedagogical, and Content Knowledge (TPACK) which refers to the knowledge of teachers in integrating technology in teaching a particular content area (Santos & Castro, 2021). In this study, this is not surprising as teachers rarely incorporate technology in teaching during the face-to-face setup. In the work of Özgür (2020), teachers' TPACK has an inverse relationship with the level of technostress. This means that a lower level of Technological, Pedagogical, and Content Knowledge can result in a higher level of technostress among teachers. Thus, increasing teachers' TPACK is one of the strategies that can reduce technostress in the digital workplace.

The overall result of this endeavor poses an alarming situation as technostress is negatively related to job satisfaction and organizational commitment (Kumar et al., 2013). This means that a higher level of technostress leads to lower job satisfaction and a lesser commitment to the organization. From this idea, if teachers show lower job satisfaction, it can lead to negative and unfavorable attitudes towards their work (Dean & Islam, 2015). Likewise, teachers with lesser organizational commitment can result to lower job performance (Mosdegh, 2016). Apart from these negative implications to the organization, technostress is also linked to an individual's psychological state.

Efiliti and Naci Çoklar (2019) confirmed that technostress has a negative association with psychological capital like self-efficacy, hope, and optimism. In other words, a higher level of

technostress implies a lower level of self-efficacy, hope, and optimism. This elucidates that technostress is a problem that needs to be addressed immediately. In the advent of the online distance setup of learning due to the pandemic, Saleem et al., (2021) explored moderating factors of technostress which include training related to technology, and creative self-efficacy which pertains to the belief that one can produce creative outcomes. The study explained that training and creative self-efficacy can manage the consequence of technostress on the respondents' job performance.

**Table 3**  
**Teachers' Level of Technostress**

Indicators	Mean	DE
I am forced by this technology to do more work than I can handle.	3.53	H
I am forced by this technology to work with very tight time schedules.	3.68	H
There are constant changes in computer software in my place of work.	3.33	M
There are constant changes in computer hardware in my place of work.	3.35	M
I need a long time to understand and use new technologies.	3.39	H
I do not have enough time to study and upgrade my technology skills.	3.51	H
I feel a constant threat to my job security due to new technologies.	3.39	H
I am threatened by co-workers with newer technology skills.	3.37	H
I have to sacrifice my vacation and weekend time to keep current on new technologies.	3.47	H
I feel my personal life is being invaded by this technology.	3.59	H
<b>Overall Mean</b>	<b>3.46</b>	<b>H</b>

Table 4 reveals the level of technostress of teachers when grouped according to age. It can be noted that middle-aged adult teachers experience a high level of technostress while young adult teachers experience a moderate level of technostress. Furthermore, teachers in the age bracket of 31 – 45 have a higher mean score as compared to the teachers in the 23 – 30 age group. The difference is statistically significant as indicated by a computed p-value of 0.0097.

Analysis of data disclosed that teachers from the middle-aged adult group experience more level of technostress compared to the teachers from the young age group. This depicts that older teachers are striving to deal with technology in the current working environment while the younger teachers were able to cope with this demand. The current finding coincides with the study of Jena and Mahanti (2014) which reported that younger academicians experience a lower level of technostress than the older ones. Tarafdar et al., (2011) suggested that this situation takes place because younger professionals are expected to be more familiar with the utilization of technology compared to their older counterparts.

Tsertsidis et al. (2019) supplemented that older individuals perceive the use of technology negatively as it makes them less competent. From this idea, the result of this study can be associated with the attitude of teachers towards the use of technology in teaching. This seems to be the case as older teachers in the sample have difficulty adapting to new teaching methods which necessitate technological tools and devices in this time of the pandemic. In contrast, younger teachers have explorative characteristics which allow them to willingly learn new skills related to ICT (Maier et al., 2019).

**Table 4**  
**Technostress Level Grouped According to Age**

ATTRIBUTE	MEAN	DESCRIPTION	t - value	p-value
Young Adult	3.22	Moderate	0.66	0.0097*
Middle-aged Adult	3.39	High		

Table 5 shows the difference in the teachers' level of technostress based on educational attainment. Teachers who are in the post-graduate level of education obtained a mean of 3.41 which indicates a high level of technostress those who attained a college graduate degree recorded a mean of 3.25 which is described as moderate. The p-value stressed that teachers at the post-graduate level have a significantly higher degree of technostress compared to teachers who are college graduates.

These results established that educational attainment significantly differentiates teachers' level of technostress. Particularly, teachers who have higher educational formal education are more vulnerable to technostress than teachers with a baccalaureate degree. This contradicts the claim of Tarafdar et al. (2011) that professionals with higher formal education experience a lower level of technostress. The author supplemented that this is due to the respondents' easier adaptability as a result of more exposure to ICT. However, researchers ascertained that higher exposure to technology indicates a higher technostress as it involves higher physical, social and cognitive skills (Ayyagari et al. 2011; Ragu-Nathan et al. 2008 & Tarafdar et al. 2007). In this study, the teachers who are at the post-graduate level are pursuing their studies in an online classroom setup.

In addition, the institution adapted an online learning modality that requires teachers to use ICT when working. This means that teachers from the postgraduate level group utilize technological tools and devices more frequently than the teachers from the college graduate group which leads to higher exposure. Boonjing and Chanvarasuth (2017) confirmed that a higher frequency in using technology results in a higher level of technostress. Specifically, the results of their study revealed that overusing mobile phones can lead to technostress that can cause personal health and even work-related issues. In today's online mode of education, one of the emerging manifestations of technostress is zoom fatigue. Zoom fatigue describes tiredness, anxiety, or worry resulting from overusing these virtual platforms (Wolf, 2020). In a further review, a more recent study conducted by Marchiori et al., (2018) stated that the difference in the level of technostress is not significantly affected by the level of formal education. This entails that teachers experience the same level of technostress regardless of the academic degree attained. The different results provided may be due to sampling and methods used.

**Table 5**  
**Technostress Level Grouped According Educational Attainment**

ATTRIBUTE	MEAN	DESCRIPTION	t - value	p-value
College Graduate	3.25	Moderate	5.22	0.00**
Post Graduate Level	3.41	High		

Table 6 presents the level of technostress of single and married teachers in this study. In this case, single teachers showed a moderate level of technostress while married teachers recorded a high level. It can be observed that married teachers recorded a mean technostress level of 3.58 which is higher than the mean of the single teachers. Furthermore, the computed p-value confirms that this difference is statistically significant.

This means that teachers who are married are more stressed when using technology at work as compared to single teachers. This contradicts the findings of Jena and Mahanti



(2014) that marital status does not have a significant impact on technostress. These disputing results may be sample-specific and affected by the situation of the respondents. Currently, the institution implemented the work-from-home setup to continue education despite the COVID-19 pandemic.

Thus, the result of this study can be linked to the family responsibilities of married teachers that interfere with their work at home. This manifests work-family conflict which arises when an individual's work and family obligations have incompatible demands, making participation in both roles more difficult (Ayyagari et al., 2011). In the proliferation of the current health crisis, researchers observed an increased work-family conflict (Vaziri et al., 2020; Isniqui, 2021 & Sandoval-Reyes et al., 2021) that can induce individuals' level of technostress (Alvarez-Rico et al., 2021). In fact, the work of Molino et al., (2020), Ghislieri et al., (2021) concluded that work-family conflict is positively related to perceived ICT stress during the pandemic. This entails that married teachers experience a higher level of technostress due to the imbalance of their work and family responsibilities.

**Table 6**  
**Technostress Level Grouped According Marital Status**

ATTRIBUTE	MEAN	DESCRIPTION	t - value	p-value
Single	3.34	Moderate	2.56	0.01
Married	3.58	High		

Table 7 displays the technostress level of male and female teachers. The data provided a mean of 3.57 and 3.31 for male and female teachers, respectively. These values describe that male teachers have a high level of technostress whereas female teachers experience a moderate technostress level. The p-value indicates that the mean technostress level of male teachers differs significantly from female teachers.

In this case, male teachers are more susceptible to technostress in contrast to female teachers. This result can be attributed to the teachers' perceived ease of use of technology in the workplace (Harahap & Effiyanti., 2015 & He et al., 2018). This supports the findings of Ragu – Nathan et al (2008) and Jena and Mahanti (2014) where male respondents experience more technostress than the female respondents. The authors pointed out that this occurs because male teachers find technology more difficult to use as opposed to female teachers.

However, recent researches posit otherwise, claiming that female teachers have higher technostress level than male teachers (Penado Abilleira et al., 2021; Estrada-Muñoz et al., 2021 & Gabr et al., 2021). As stated by Sriwidharmanely et al. (2021) emotional state is a contributory factor of technostress. In line with this statement, Thibaut & van Wijngaarden-Cremers (2020) reported that emotional distress was more intense in women during the COVID-19 pandemic. Results of different studies do not clearly show which sex is experiencing more technostress. In the work of Coklar (2016), Rahman and Yadav (2020), the difference in technostress levels between male and female teachers does not significantly vary which shows that male and female teachers are unable to cope with technology-related demands in the environment to the same extent.

**Table 7**  
**Technostress Level Grouped According Sex**

ATTRIBUTE	MEAN	DESCRIPTION	t – value	p-value
Male	3.57	High	5.13	0.00**
Female	3.31	Moderate		

## V. CONCLUSIONS AND RECOMMENDATIONS

In light of the findings of this study, the researcher concluded that teachers are not able to cope with the demands of the online working environment. It can also be noted that age, sex, educational attainment, and marital status are contributory factors in the level of technostress experienced by teachers in the current set-up of education. In addition, this endeavor provided results that contradict existing literature in line with sociodemographic characteristics as factors that influence technostress.

In relation to the aforesaid, the researcher recommended that academic institutions may implement a technostress wellness program to manage the teachers' level of technostress. The researcher proposed that the program could be designed based on teachers' sociodemographic profiles considered in this research. Further studies may also be conducted to establish clearer findings on this phenomenon. Finally, future researchers may include more respondents in the sample and employ different quantitative methods.

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