



Technostress and Telecommuting in the Context of Covid-19: Evidence from Cambodia's Higher Education Institutes

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Abstract

Closures of educational establishments owing to the COVID-19 pandemic have impacted individuals globally. Educational organizations of all levels have been compelled to use online instruction because comprehensive safety precautions have been taken to minimize the spread of disease during the COVID-19 contagion, which has increased technostress. Both public and private organizations utilized these strategies, allowing the individual to work virtually.

Purpose- This work examines the association between the perceived technostress attributes and instructors in Cambodian academic institutions during the COVID-19 pandemic.

Design/Methodology- It used a quantitative method and constructed a research instrument to examine (340 participants) of public and private instructors service during the outbreak. Additionally, the data was collected and analyzed using structural equation modeling (SEM).

Findings- The study revealed that technostress had a substantial effect on the gender, age, and working experience of educators. Hence, given the rapid evolution of ICT trends, it is appropriate to design practical training and wellness programs to alleviate technostress and foster a sense of technological competence and personal relevance.

Introduction

The Covid-19 outbreak that emerged in late 2019 has expanded rapidly worldwide. The virus had infected approximately 241 million people worldwide, resulting in nearly 5 million deaths as of October 2021 ([World Health Organization, 2021](#)). As a result, most academic institutions across the nation closed their sites, shuttered halls, and switched the remainder of the semester to virtual classrooms because of the out-of-control virus. Thanks to this option, students could finish courses and continuously progress academically. However, lecturers received very little notice before moving in-person courses to the online setting. Equally, academics immediately adapted by leveraging digital or blended learning spaces to blend and synchronize information and communication technologies (ICTs) to keep up with the rapidly changing classroom environment. Thus, educators play a significant role in bringing technology into the classroom. However, technology implementation hinges on instructors' adoption, which has proven to be a substantial challenge in educational settings ([Yuen & Ma, 2008](#)). While lecturers are the first to adopt technology and innovate education, they also endure a lot of job pressure because they must keep up with the latest developments in their fields ([Li & Wang, 2021](#)). Even though using technology in education is recommended, several studies have found numerous roadblocks to overcome, insufficient technological expertise support, poor infrastructure, and inadequate training. Lecturers may become anxious and stressed because of these difficulties, leading to physical and mental health problems associated with the use of technology ([Joo et al., 2016](#)). As a result, technostress is currently a significant issue in schooling. Also, it is caused by social and institutional pressures on instructors to integrate technology. These unfavorable feelings about using technology for online teaching can inhibit educators from using it and seriously affect learning and student outcomes. Therefore, this work gauged the impact of technostress on educators lecturing at higher education institutions in Cambodia, where organizations were closed as a safety concern in the wake of Covid-19. Additionally, it contributes to the body of knowledge on the subject, which can be utilized to establish policies and initiatives for effective ICTs in education beyond the Covid-19 pandemic.

Technostress and COVID-19

Technostress is characterized as the incompetence of an individual in dealing with problems using technology ([Tarafdar et al., 2007](#)). It does not typically manifest itself abruptly. Also, it is a nuanced notion with some antecedents. Among the determinants of technostress is an incapability to use a computer effectively, concern about limited personal performance, incompetence to comprehend information overload, the rate of digitalization, and heavy workloads ([Okebaram & Moses, 2013](#)). The stress related to ICT use has been examined in various domains, particularly in higher education institutions ([Bondanini et al., 2020](#); [Penado Abilleira et al., 2020](#); [Wang et al., 2020b](#)). Likewise, technological stress is a severe disease globally ([Bozionelos, 1996](#); [Khan et al., 2016](#); [Lee et al., 2016](#); [Tu et al., 2005](#)). The consequences are seen throughout the globe. For example, stress costs the US economy about \$300 billion annually because of decreased productivity, staff turnover, absenteeism, and workplace accidents ([Smith, 2016](#)). However, the losses from technostress are very undoubtedly significant. Educators who are techno-stressed may exhibit several physical and mental symptoms, including anxiety, frustration, exhaustion, failure to focus, high hydrocortisone generation, frustration, suspicious, depression, and intrusive feelings ([Cox et al., 2000](#); [Mahalakshmi & Sornam, 2012](#); [Wang et al., 2008](#)).

On January 30, 2020, WHO proclaimed the COVID-2019 pandemic a public health emergency triggering a global lockdown ([Wang et al., 2020a](#)). Several authorities embrace modern technology to combat COVID-19, resulting in civilian techno-stress ([Bartoszeko, 2020](#)). Many initiatives have been put in place to control the spread of this infection, the most important of which was the virtual workplace, which isolated individuals in their homes ([Coccia, 2020](#); [Molino et al., 2020](#)). Although it was not commonly used in Cambodia before the Covid-19 lockdown, telecommuting has evolved into a necessary and prevalent option. In addition to significant

changes in behavior, the effects on mental health were also due to trends. These factors have been linked to several psychological problems, including increased stress and diminished mental well-being (Coccia, 2020). The pandemic intensified ICT diffusion in all spheres of society, and while the full extent of its impact is unknown, technostress may rise as a result (Bondanini et al., 2020). This approach is plainly at odds with the necessity of rapid ICT change during Covid-19. The rapid pace of change may have elevated the potential of technostress for all individuals concerned.

Conversely, the adoption of ICTs has significant adverse effects on organizations and individuals. Disruptions in organizational operations, individual functions, and roles induced by ICTs have made organizational behavior a primary source of stress for the workers today (Rowden, 2005). In addition, more and more people are concerned about the invasive nature of technology in their personal lives (Bright & Logan, 2018; Salo et al., 2018).

Technostress and Educators

Technostress is stress associated with ICT usage mainly caused by the abrupt pace of technological progress (Sahin & Çoklar, 2009). Consequently, it has the potential to have a wide range of adverse implications for employees and their organizations (Fuglseth & Sørebo, 2014; Hsiao, 2017; Tarafdar et al., 2015). Additionally, it can form anxiety, fatigue, and depression, with lower productivity and job satisfaction (Wang et al., 2020b). According to Penado Abilleira et al. (2021), the anxiety aspect (techno-anxiety) encompasses psychological (anxiety of causing damage to the system), social (anxiety about being displaced by technology), and operational (anxiety of technological incompetence). Alongside anxiety, technology users experience fatigue (techno-fatigue), weariness, and mental and behavioral exhaustion (Penado Abilleira et al., 2021). Furthermore, skepticism (techno-skepticism) is a technostress's disposition attribute; it represents the unfavorable assessments caused by technology use, for example, insensitivity or an alienated attitude toward technology (Salanova et al., 2011). Lastly, it is a negative sentiment about their capacity to use technology efficiently (techno-inefficacy) (Salanova et al., 2013).

However, ICTs are being adopted quickly in work environments, organizations, and educational settings (Manco-Chavez et al., 2020; Matteucci et al., 2005). Although teaching is not a conventional classroom role, many institutions integrate ICT, flipped classrooms, open and distance programs, and linked novice technologies (Li & Wang, 2021). However, Çoklar et al. (2016) argue that institutional and cultural pressure to integrate technology into education might cause technostress among instructors. Individual difficulties, technological challenges, education-related difficulties, health issues, and time constraints are all common causes of educator technostress. Likewise, several conditions could cause it. First, learning new practices, tools, and terminology can add to workload and time constraints. Second, lecturers may need to adapt their practices because technology has become more prevalent in the classroom. Third, technostress occurs when instructors feel obligated to use technology even if it is not their preferred method (Syvänen et al., 2016). Lastly, insufficient technology development may result in confusion, annoyance, and a reluctance to use it.

Numerous studies have been performed to ascertain how technostress affects educators. For example, according to Syvänen et al. (2016), female teachers were seen to suffer more than male instructors, and those with practice (16-30 years) in the profession experienced higher levels of technostress than less experienced personnel (15 years or under). They argue that job-related characteristics may have a more significant impact on technostress than demographic factors and suggest that ICT competence is the most critical determinant of technostress. Also, Çoklar et al. (2016) argue that it is essential to note that there are disparities between female and male lecturers in terms of technostress. They claim that women tend to be more stressed out about the need for technical assistance, system, and connection issues, while men tend to be more stressed out about personal issues like self-efficacy and their attitude about technology use in general and the current economic condition. Likewise, Dong et al. (2020) concluded from their investigation of 366 Chinese K-12 in-service

teachers that technological pedagogical content knowledge was associated with teacher technostress. They further argue that teacher self-efficacy was more significant than institutional support, and training courses would have to include problem-solving skills instead of specialized processes for specific situations since this can lead to enhanced confidence. Equally, [Al-Fudail and Mellar \(2008\)](#) claimed that technostress is caused by a mismatch between teachers' subjective and objective needs to use technology and their abilities.

Furthermore, [Alvites-Huamani \(2019\)](#) revealed a strong correlation between stress and psychological variables, including work conditions, workloads, characteristics of responsibilities, academic roles, advancement in careers, social contacts, and organizational factors in basic and higher education teachers in Latin America, North America, and Europe. On the other hand, [Mondal et al. \(2011\)](#) found that educators reported modest to moderate stress levels and partial job satisfaction. This was probably due to difficult working conditions and the need for institutional assistance and recognition. Also, educators are particularly vulnerable to burnout due to various stressors, including sudden changes in terms and conditions of employment without notice, the assignment of responsibilities without decision-making authority, and a lack of resources to complete the work ([Agai-Demjaha et al., 2015](#)). This influences the mental and behavioral health of the student body and school performance; therefore, it is crucial to apply appropriate stress management strategies to address difficulties with student behavior or classroom management ([von der Embse et al., 2019](#)). Recently, the integration of ICTs into education has emerged as a topic of interest, requiring instructors to possess the skills necessary to use and integrate ICTs as a learning tool, resulting in the stress known as technostress.

Therefore, the following research hypotheses were proposed for additional study based on established analysis:

H1: Perceived experience of techno-anxiety is positively associated with the gender of educators

H2: Perceived experience of techno-anxiety is positively associated with the age of educators

H3: Perceived experience of techno-anxiety is positively associated with the working experiences of educators

H4: Perceived experience of techno-fatigue is positively associated with the gender of educators

H5: Perceived experience of techno-fatigue is positively associated with the age of educators

H6: Perceived experience of techno-fatigue is positively associated with the working experiences of educators

H7: Perceived experience of techno-skepticism is positively associated with the gender of educators

H8: Perceived experience of techno-skepticism is positively associated with the age of educators

H9: Perceived experience of techno-skepticism is positively associated with working experiences of educators

H10: Perceived experience of techno-inefficacy is positively associated with the gender of educators

H11: Perceived experience of techno-inefficacy is positively associated with the age of educators

H12: Perceived experience of techno-inefficacy is positively associated with the working experiences of educators

Methods and Materials

This work applied a quantitative method and developed a research instrument to investigate the relationship between the attributes pointed to technostress's perceived experience and instructors in Cambodian institutions' education. The measurement instrument and questionnaire have addressed the specific aims of the study based on a theoretical review.

The measurement of technostress was compiled from previous technostress literature (e.g., [Dong et al., 2020](#); [Penado Abilleira et al., 2020](#); [Salanova et al., 2013](#); [Wang et al., 2020b](#)). These scales have four constructs (Anxiety, Fatigue, Inefficacy, and Skepticism) and sixteen items evaluating their significance on a five-point Likert scale (from strongly disagree to strongly agree). In addition, confirmatory Factor Analysis (CFA) was used to validate the instrument for measuring technostress. The CFA approach determined how observed variables are essential with the applied latent construct. This analysis is based on the strength of the regression model connecting the factors to the observed variables rather than the relationship of the variables ([Byrne, 2010](#)). Equally, [Byrne \(2010\)](#) suggests that a sample size of five to ten times the total number of survey items while doing CFA, and this study had 16 items; therefore, $n=160$ was deemed sufficient. Statistical Package for Social Science (SPSS) version 25 was applied for statistical analysis, and a significance level of .05 was specified. The Kaiser–Meyer–Olkin (KMO) sampling adequacy measure and Bartlett's test of sphericity were used to determine whether the sample was appropriate for this study. The total variance explained was 62.9%. Also, [Fornell and Larcker \(1981\)](#) claim that acceptable internal consistency requires Cronbach's alpha > 0.70 . Likewise, when the χ^2/df value is less than 5.0, hypothesis models correspond to the analyzed data ([Marsh & Hocevar, 1985](#)).

Participants and Sampling

Convenience sampling techniques were used because of their convenience and availability ([Bryman, 2016](#)) through self-administered questionnaires to determine the sample of personnel work-related instructors in Cambodia during the COVID-19 epidemic that participated in this study.

The report yielded a total return of 340 distributed questionnaires, more than the minimum threshold of 160. The profile of respondents revealed that 77.6% were male, and 22.4% were female. Equally, 75.3% and 24.7% worked in public and private institutions. In addition, 62.1% were undergraduate (Bachelor), 28.2% were graduate (Master), 5% were vocational (Skill courses), and the remaining 4.7% were post-graduate (Doctorate) in qualification. Related to the working settings, 85.3% worked full-time, and 14.7% employed part-time. Also, it is essential to realize that 43.1% of lecturers sampled have an average teaching experience of 5-10 years, 40.3% with more than 10 years, and only 16.5% was less than 5 years of experience. Similarly, 48.5% were aged 36-52 years, 46.8% were less than 35, 2.4% were 52-64, and the remaining 2.4% were 65 years and above.

Assessment of Measurement Model

This work established a measuring model to check for structural and reliability and convergent and discriminant validity. First, the high loading values for each indicator should be verified in the measurement model. According to [Hair et al. \(2019\)](#), it should be over 0.70. Next, the internal consistency of the constructs was calculated utilizing composite reliability (CR) and Cronbach's alpha coefficients. A value of 0.7 or more is appropriate for CR and Cronbach's alpha ([Hair et al., 2019](#)). Finally, this study examined the AVE values of variables for convergent validity. The findings of the measuring model are illustrated in **Table 1**.

As demonstrated in **Table 1**, all constructions have adequate internal consistency with CR and CA values > 0.70 . Similarly, construct reliability was more considerable than 0.7 to establish convergence validity among the constructs ([Hair et al., 2013, 2019](#)). Also, acceptable AVE should be 0.50 or higher ([Hair et al., 2019](#)). Therefore, there was enough validity and reliability to support the analytical study.

Table 1. Results of Confirmatory Factor Analysis ($n = 340$)

Constructs	Loadings	CA	CR	AVE
TA1	0.79	0.77	0.86	0.60
TA2	0.76			
TA3	0.90			
TA4	0.64			
TF1	0.81	0.74	0.83	0.56
TF2	0.81			
TF3	0.57			
TF4	0.79			
TI1	0.82	0.81	0.88	0.65
TI2	0.74			
TI3	0.83			
TI4	0.82			
TS1	0.81	0.80	0.87	0.63
TS2	0.78			
TS3	0.70			
TS4	0.87			

Cronbach's alpha (CA), Composite Reliability (CR), Average Variance Extracted (AVE)

Techno-Anxiety (TA), Techno-Fatigue (TF), Techno-Inefficacy (TI), Techno-Skepticism (TS)

Results

Hypothesis one suggested that the perceived experience of techno-anxiety is positively associated with the gender of educators. As results depicted (Table 2), this relationship was positive and significant ($\beta = 1.054$, $t = 10.396$, $p < .05$), which indicated the acceptance of H1. Thus, it specifies that techno-anxiety impacts the gender of instructors. Next, testing the relationship between techno-anxiety and educators' age revealed ($\beta = 3.183$, $t = 20.373$, $p < .001$) statistically significant and supported H2. Therefore, it describes techno-anxiety positively impacting the age of education. Furthermore, the perceived relationship between techno-anxiety and the working experiences of educators was ($\beta = 2.744$, $t = 16.512$, $p < .001$) statistically positive and significant. Hence, H3 is supported. It signified that those instructors perceived the same techno-anxiety even if they had more working experience.

Hypotheses four proposed the association of techno-fatigue with the gender of lecturers quantified ($\beta = 1.069$, $t = 10.015$, $p < .001$) statistically significant and positive relationship. Hence, H4 is accepted. Similarly, the perceived experience of techno-fatigue was statistically significant and positive ($\beta = 2.973$, $t = 17.998$, $p < .001$) associated with the age of educators and accepted H5. However, H6 ($\beta = 2.629$, $t = 13.929$, $p = 0.121$), which suggested the perceived experience of techno-fatigue is positively associated with the working experiences of educators, was not supported. Therefore, it submits that techno-fatigue has not impacted the instructors due to their working experience.

Table 2. Hypotheses Testing Result

Constant	Gender			Age			Working experience		
	β -values	t -values	p -values	β -values	t -values	p -values	β -values	t -values	p -values
TA ->	1.054	10.396	<.05	3.183	20.373	<.001	2.744	16.512	<.001
TF ->	1.069	10.015	<.001	2.973	17.998	<.001	2.629	13.929	0.121
TS ->	1.567	16.761	<.001	3.269	22.834	<.001	2.678	16.835	<.001
TI ->	1.604	17.896	<.001	2.967	22.289	<.001	2.667	16.974	<.001

Squared Multiple Correlation (R²):
Gender: R² for TA = 0.033, TF = 0.078, TI = 0.110, TS = 0.110
Age: R² for TA = 0.068, TF = 0.104, TI = 0.204, TS = 0.153
Working experience: R² for TA = 0.117, TF = 0.021, TI = 0.072, TS = 0.125

Moreover, the perceived experience of techno-skepticism and the gender of educators were found to be a statistically significant and positive association ($\beta = 1.567$, $t = 16.761$, $p < .001$), resulting in the acceptance of H7. Besides, the test of perceived experience of techno-skepticism with the age of educators presented ($\beta = 3.269$, $t = 22.839$, $p < .001$) a significant and positive relationship. Thus, H8 is supported. Similarly, the test of H9 was supported because there was a statistically significant and positive relationship between the perceived experience of techno-skepticism and the working experiences of educators ($\beta = 2.678$, $t = 16.835$, $p < .001$).

Additionally, the proposed perceived experience of techno-inefficacy and the gender of educators depicted a statistically significant and positive association ($\beta = 1.604$, $t = 17.896$, $p < .001$), which supported H10. Also, the test of techno-inefficacy associated with the age of lecturers was found to be positively and statistically significant ($\beta = 2.967$, $t = 22.289$, $p < .001$), resulting in an acceptance of H11. Finally, the perceived experience of techno-inefficacy and the working experiences of educators were statistically significant and positively relationship ($\beta = 2.667$, $t = 16,974$, $p < .001$), which supported H12.

Discussion

This work aimed to investigate the impacts of perceived technostress attributes on instructors in Cambodian educational institutions in the context of Covid-19. Whether stress has been researched concerning another characteristic or as an attribute itself, its ubiquity and importance in instructional practices remain unwavering. Technostress affects educators and other professions for several factors. This topic and demand arose because of the study, which looked at the technologies instructors required to use to efficiently carry out their daily work activities, resulting in technostress. The following variables were used to depict the relationship of technostress attributes (anxiety, fatigue, skepticism, and inefficacy) with instructors (gender, age, and working experience).

Gender differences in perceptions of technostress were identified. Since most of those who responded were males, females have been found to experience more technostress generally. Thus, it echoes the previous findings (Syvänen et al., 2016). Because of believing their current teaching job had a substantial and positive impact on how they feel about techno-anxiety, especially the strong tension and anxiety when working with technology. Also, they get fatigued after working with ICT, exhausted from their interactions with them, and lack the energy to do anything else. Equally, they feel doubts when using these technologies, and the view of the contribution of technology to their work is more skeptical. Likewise, they believe they are inefficient when it comes to applying technology. It is consistent with research from the incident, which show that females experience higher amounts of stress (Cao et al., 2020; Qiu et al., 2020; Taylor et al., 2020), who considered the situation was more

difficult than male did ([Commodari & La Rosa, 2020](#); [Li et al., 2020](#)), and females have a higher risk perception than males ([Harris & Jenkins, 2006](#)). Additionally, females are frequently reported to be more security conscious and vulnerable to technology engagement ([Chou & Sun, 2017](#); [Milne et al., 2009](#); [Mohamed & Ahmad, 2012](#)).

The age variable also showed significant disparities. It is important to note that instructors (aged 53–64) had significantly higher mean results for perceived anxiousness and ineffectiveness. Furthermore, the group of instructors (aged 36–52) experienced higher exhaustion and skepticism regarding current technology, and they are uncertain of the usefulness of such competencies. Although this study also aligned empirically that the relationship between individual aging and technological stress appears significant ([Sahin & Coklar, 2009](#); [Tams, 2017](#)), some believed that the converse was correct ([Jena & Mahanti, 2014](#); [Tarafdar et al., 2011](#); [Zhou & Salvendy, 2019](#)). However, the findings suggest that the older age group of instructors are more susceptible to technostress than the younger group. This is similar to research indicating that the younger age group is more up to date with contemporary technology and thus less prone to suffer from technostress ([Mahalakshmi & Sornam, 2012](#)).

Depending on the nature of relevant work experience, the following variables on technostress qualities were statistically significant. First, instructors with a proven experience of 5–20 years were more likely to believe applying technological tools in the virtual classroom causes them to feel anxious and impacts their teaching. Second, they perceived skepticism about the pace of innovation had caught their attention over time. This is consistent with previous studies indicating that individuals with more job experience had increased technostress ([Syvänen et al., 2016](#)). Third, however, they perceived a negative correlation about techno-inefficacy, especially concerning using ICT to complete their work. Alternatively, no significant perceived techno-fatigue was discovered among the working experience group. As a result, they were exhausted after completing their task with ICT and were unable to perform anything else, irrespective of their relevant experience.

Conclusion

This study sheds light on the latent variables that contributed to instructors' perceived technostress during the COVID-19 epidemic, which prompted the switch to virtual classrooms. The results supported all hypotheses and proved the validity of the proposed conceptual model. Although technology is transforming the way individuals work and communicate, online education has yet to embrace technology fully. The progress is slow, and everyone is caught up in ambiguity and issues within the course ([Mitchell et al., 2015](#)). Incorporating ICT into teaching and learning indeed has the potential to improve teaching and assessment while also enhancing student accomplishment but doing so requires an increase in the knowledge and abilities required for educators to do so effectively. Therefore, educators are constantly attempting to stay up with the progress of technology while also incorporating pedagogical innovations. They may feel more stressed because of dealing with this owing to the constant need to adjust. Hence, several attributes may lead to COVID-19-related stress, including the significant impact on health and well-being and concerns about job loss because of COVID-19-related constraints, economic woes, and wellness issues. These concerns and anxieties could lead to a lower standard of living and the creation of harmful remedies, especially after the COVID-19 calamity ([Achterberg et al., 2021](#)). Equally, public health, economics, and society are at stake if policymakers do not support effective long-term solutions to combat infectious diseases like COVID-19 ([Coccia, 2021](#)). In addition, the gap between work and home life might become increasingly blurry for virtual office workers due to their mobility. Accordingly, the strain of working in a virtual office has been permitted to extend from the traditional office, perhaps resulting in fewer social connections and inadequate contact ([Okonoda et al., 2017](#); [Stich, 2020](#)).

Finally, it is believed that the findings of this study would provide an avenue for academic institutions to handle technostress. Given the quickly changing ICT trends, developing practical training and wellness programs is appropriate to lower academic stress and build a sense of technological competence and personal significance.

Ethics Statement

Human volunteers did not require ethical review or permission under local legislation and institutional criteria for the study. The questionnaire informed participants not to provide any identification or information in this work. Participants submitted consent to participate in the study after being adequately informed.

Limitations and future work

There are some limitations to this study that should be considered when interpreting the findings. Initially, a focus solely on the education institutions in Cambodia inhibits generalizability, as does the diversity of employment and organizational culture may impede generalization. Thus, future research should contain cross-country analyses and comparisons of technostress practices in different countries. Lastly, considering only quantitative methods are used in the study, it is difficult to make a more profound examination; therefore, qualitative and quantitative approaches should be incorporated in the future research to obtain more details.

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