Effect of Technostress on Academic Productivity: E-Engagement Through Persuasive Communication

Deepa Sethi, Indian Institute of Management, Kozhikode, India
Vijay Pereira, NEOMA Business School, France
Vikas Arya, Rabat Business School, Morocco

ABSTRACT

The focus of most of the existing studies on technostress is with regard to working professionals. In spite of the explosion of digital device use in education, not many studies have identified its effects on students. This study examines the presence of technostress among management students aged 22-29 years. Using a sample of 300+ students of a management college of India, this study validates the technostress instrument. With the pandemic, education has seen a paradigm shift. Sessions including classes, interactions, discussions, team projects, assignments, examinations have gone online, and this has ushered the compulsion of spending more time with technology and digital devices (laptops, mobile phones, desktop, etc.). It examines the effect of technostress on academic productivity of students. The study further explores the students’ expectations from the college to control their technostress, thereby indicating the need of enhancing e-engagement through persuasive communication.

KEYWORDS

Online Engagement, Productivity, Technostress

1. INTRODUCTION

Technology has seen a complete overhaul in the last few decades. What was once a luxury has now become a way of human beings’ life (Molnar, 1997). Technology has invaded the very way of people’s lives. It has taken over almost every day-to-day activity of people and has modified the manner people undertake these. Technology in the form of Information Communication Technology (ICT) dominates human life today. ICT is the type of technology that can transmit, process, create, save, show, share, and exchange information by electronic means (UNESCO, 2007). Consequently, cell phones, laptops, email, the Internet and many other forms of communication are termed as ICTs.

Advancement in ICT and its omnipresence has augmented its usage among higher education institutions. The teaching-learning phenomena has seen a drastic enhancement with technology. Dunn and Kennedy (2019) indicated that the usage of Technology Enhanced Learning has seen precipitous increase because of government motivations and to meet students’ anticipations. Technology has become the pivot around which academic administration, teaching, student learning revolves (Wang et
al., 2018). ICT has been found to be beneficial in several ways. While Deming et al. (2015) stated that online learning and MOOCs decrease the higher education costs for the learners, Vahedi et al. (2019) concluded that the learners perceive ICT assimilation in the classroom positively. The educational institutes identified the importance of ICT in enhancing the teaching-learning experience (Mirzajani et al., 2016), and in decreasing paperwork (Pattinson, 2017).

While considering the importance of ICT in academic learning, it is equally important to resolve those issues which may increase the level of technostress in students. The implication of e-learning in academic institutes will increase the productivity of the students and academicians both, and it would be a supportive addition to the theory of learning and process of information. Theory of cognitive given by Snow & Lohman (1984) can be extended further in the context of academic learning, where academic institutes as a whole are transforming while introducing ITC based learning in the academic system.

The present pandemic situation has proved that online teaching is not just an option, it has become a necessity (Adedoyin & Soykan, 2020), where sessions including classes, interactions, discussions, team projects, assignments, examinations, have gone online and this has ushered the compulsion of spending more time with technology and digital devices (laptops, mobile phones, desktop etc).

Although there are merits of the use of technology, there has also been a rising awareness to comprehend the negative effect of technology on those using it; and one such negative effect is technostress. Technostress is a contemporary ailment that demonstrates as the failure to adjust, the inability of connecting effectively, and non-healthy reactions to new technologies and their impacts on life (Brillhart, 2004; Gendreau, 2007; Tarafdar et al., 2007; Wang, Shu & Tu 2008).

Research has delved into adverse effects of technostress on the productivity of employees (Tarafdar et al., 2007, 2019; Torre et al., 2019; Hauk et al., 2019; Sarabadani et al., 2018); of knowledge workers (Chen, 2015); and in older adults (Nimrod, 2017). Davies (2015) observed that students experienced technostress during their first online evaluation; Qi (2019) propounded that the usage of mobile devices did not impact technostress. Very few studies have investigated the occurrence and effect of technostress on students (Rolon, 2014). Technostress among students may lead to productivity and distractions. Moreover, today’s generation students are termed as Digital Natives (Prensky, 2001) due to their unique attributes. So, examining the occurrence of technostress among this generation and its effect on academic productivity would be useful to fill the gap in the existing literature.

With this background, this study uses the technostress scale put forward by Tarafdar et al. (2007) and validates it in an academic setting and determines the technostress levels among the postgraduate students in a management college. The study also identifies the association between technostress and academic productivity (Upadhyaya & Vrinda, 2020). Through responses to one open-ended question, the study further explores the students’ expectations from the college to control their technostress, thereby resulting in enhanced e-engagement. The study also proposes Aristotle model of persuasive communication for enhanced e-engagement.

2. LITERATURE REVIEW

Brod (1984) introduced the term, Technostress, defining it as a modern disease of adaptation to technology. Clark and Kalin (1996) contradicted stating that it was not a disease but a negative psychological effect caused by technology. Several definitions of technostress exist in literature: it is a reaction to technology (Brillhart 2004; Gendreau, 2007); it is the mental state of employees due to prolonged use of technology (Arnetz and Wiholm, 1997). Hung et al. (2011) termed technostress as technophobia, while Laspinas (2015) called it computer anxiety.

Additionally, while Çoklar and Sahin (2011) explain technostress as a component of stress; Wang, Shu and Tu (2008) find it more explicit than routine stress. Technostress affects individuals in various ways. Employees with an urge to constantly connect with the workplace, and incessantly reply to emails have more technostress (Tarafdar, 2011).
The creators of technostress: techno-overload, techno-uncertainty, techno-complexity, techno-insecurity, and techno-invasion as suggested by studies (Tarafdar et al., 2007; Tarafdar, Tu, & Ragu-Nathan, 2010); are examined by a number of studies (Ayyagari, 2007; Ayyagari, Grover & Purvis, 2011; Ayyagari, 2012; Hung, Chang, & Lin, 2015; Ragu-Nathan, Tarafdar, Ragunathan, & Tu, 2008; Tu, Wang & Shu, 2005, Wang et al, 2008). The framework was revised by Tarafdar et al. (2019) as a trifecta by considering techno-eustress, techno-distress, and information systems design.

Technostress affects destructively several behaviours in the organizations like role stress and productivity (Tarafdar et al., 2007; Hung et al., 2015); satisfaction (Fuglseth & Sorebo, 2014); commitment and strain (RaghuNathan et al., 2008); burnout (Rod & Ashill, 2009; Mahapatra & Pati, 2018); work-life balance (Harris et al., 2012). Galluch (2009) pointed out that some of over $650 billion lost as productivity losses in the United States, are directly related to technostress. According to Almeida (2014), education has been improved using technological equipment but has also produced negative effects in students. Studies (Morris & Morris, 2010; Insua, 2016) have noted that technology affects academic performance positively.

3. CONCEPTUAL MODEL

3.1. Technostress and Productivity

Research has indicated that productivity in terms of technology usage is referred to as task productivity and augmented work efficiency (Torkzadeh & Doll, 1999; Tarafdar et al., 2007). Technostress affects workplace productivity negatively (Tarafdar et al., 2007; Hung et al., 2011); and additionally impacts quality of life of the employees also (Lee et al., 2016). Therefore, study proposes that

H1: Technostress negatively affects students’ academic productivity.

3.2. Technostress and Gender

Research has proved (Broos, 2005; Qi, 2019) that technostress affects male students’ academic performance less than it affects females. Chandra et al. (2019) indicated that males excel in innovation using technology. Studies (Broos & Roe, 2006) showed that females find frequent usage of technology and internet complicated in psychological and social terms and they experience enhanced levels of anxiety while using technology as compared to males (Tekinarslan, 2008), which affects negatively their academic performance too. On the other hand, Ragu-Nathan et al. (2008) and Tarafdar et al. (2014, 2019) proved that male employees suffered more technostress than female employees. Accordingly, this study proposes that

Hypothesis 2: The causal relationship of technostress and academic productivity of students varies between female and male students.

3.3. Technostress and Level of ICT Experience

ICT experience refers to the number of years spent using technology. Zhao et al. (2020) stated that ICT experience is positively related with productivity but negatively related with technostress. Qi (2019) did not find any significant association of technostress with ICT experience. Studies (Ragu-Nathan et al., 2008) concluded that managers who have better ability using ICTs suffer lower technostress; and those with less experience suffer more technostress (Shu et al., 2011). Consequently, the study proposes the research model is presented in Figure 1 and the following hypothesis

Hypothesis 3: The causal relationship of technostress and academic productivity of students varies with the level of level of ICT experience of students.
4. RESEARCH METHODOLOGY

This is mixed methodology based research, where quantitative and qualitative both research techniques were used. Respondents for both the studies were the same, and they responded to 27 Items measured on Likert scale and to one open ended question. The data was collected during the first week of December 2020.

4.1. Data Collection

The study was conducted amongst the students pursuing postgraduation in management in a government recognised high-ranked management college in Southern India. The college uses ICT in every sphere of its activity: admission procedure, student attendance, teaching-learning process, evaluation and placements.

4.2. Survey Instrument

Technostress among students was measured using a 23 item scale suggested by Tarafdar et al. (2007). All the items were rated on five-point Likert scale. Technostress was sculpted as a second-order construct, with five sub-dimensions: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty.

Techno-overload is the impact of technology that compels students to multitask, work at a high speed and for long hours. Techno-invasion is the impact of technology that compels students to work in addition to the routine college timings and encroaches their personal lives. Techno-complexity is when because of technology, students feel that they are incapable in handling new and complex technology. With reference to higher education, Techno-insecurity is when students feel intimidated with regard to falling academic performance in comparison with their peers, who use technology better than them. Techno-uncertainty is when students face uncertainty due to recurrent modifications.
and advancements in technology. The statements in the original scale were altered to conform to the academic setting (Upadhyaya & Vrinda, 2020). Academic productivity was examined as a four-item scale modified from Torkzadeh and Doll (1999) and Tarafdar et al. (2007), altered to the academic setting (Upadhyaya & Vrinda, 2020). The modifications made to the original instrument are elaborated in a separate section in the Appendix 1. Technostress as used by this study refers to the day-to-day computer applications one uses in one’s college, such as e-mails, zoom sessions, mobile phones, whatsapp messages, and any other education and studies-related information technologies.

And with the help of statistical analysis methodology and process for scale development (Churchill, 1979; De Vellis, 1991) we validated the scale in the context of Techno-stress and Academic productivity. Because this study adapted the scale from previous studies which were conducted in some other context, therefore we have done the scale validation process using EFA, before further analysis. This study is based on descriptive analysis, where we collected the data of young generation aged between 22 years to 29 years. To collect the data, we used Google Survey forms, and distributed using Convenience Sampling technique because all the respondents were from a management college studying the same course. Convenience sampling is the selection of respondents based on their easy availability. It is considered the best for research among students as it is easier than other sampling techniques (Ackoff, 1953). For assessing the internet addiction of the respondents, 27 statements were taken and quantified on five point Likert scale ranging from ‘strongly agree’ to ‘strongly disagree’ respectively. We received around 320 responses, out of which 17 were not filled correctly or missed some information, so we deleted those 17 responses from our data set. So, we have analysed 303 responses to validate this study. The Scale development process is carried out with the following five steps procedures: Item generation including pilot study of the items, (b) Adequate data collection to generalize the results of the study, (c) Exploratory Factor Analysis (EFA) for items reliability, (d) Measurement model analysis for items reliability and validity measurement (e) Structural equation analysis. To make sure the analysis reports disclosing the accurate results we used SPSS-18, SMART-PLS 3 software.

An open ended question was used in the instrument, which we analysed by using the NVivo Software, and we identified key themes that emerged from this qualitative analysis. Quotes from the students were then used to strengthen the themes.

5. DATA ANALYSIS

5.1. Demographics of the Respondents

The demographic details of the respondents are illustrated in Table 1. And according to the details drawn from the data analysis; out of 303 respondents, approximate 54 percent were male and on an average 50 percent were having experience of 1 to 5 years of using ICT. The details are explained in Table 1.

5.2. Quantitative Data Analysis

5.2.1. Exploratory Factor Analysis

The values of Skewness are ranging between -.511 to + 1.04 with standard error .140, and the value of Kurtosis raging between -.969 to + .018 with standard error .279, which conclude that the value of Skewness and Kurtosis are meeting the threshold value as all the values are between -3 to +3, which is acceptable. The value of correlation coefficient of the particular item with respect to the other items belong to the same construct is more than 0.5, and less than 0.5 with respect to the items that belong to other constructs, which revealed that the items are retained to pursue further analysis of Principal Component Analysis (PCA). The value of KMO test is found .868 which is greater than the threshold value of 0.5, and Bartlett’s test of Sphericity disclosed the Chi-Square value 5287.2 with 351 degree of freedom, which is significant at 0.05 level.
According to the results received after the EFA analysis conducted with all 27 items, the composite value of new variance of all the 27 is explaining around 69.17% of variance with the formation of four factors along with the Eigen values ranging from 6.42 to 25.20.

All the 27 items are segregated in four factors where first factor (TO1-TO5) is incorporated with five items with factor loading values ranging between 0.66 to 0.82, second factor (TI1-TI4) incorporated four items with factor loading values ranging from 0.76 to 0.81, third factor (TC1-TC5) incorporated five items with factor loading ranging from 0.70 to 0.85, fourth factor (TIS1-TIS5) incorporated four items with factor loading values ranging from .76 to .85, fifth factor (TU1-TU4) incorporated five items with factor loading values ranging from .79 to .86, and last factor (P1-P4) is framed incorporating all four items with factor loading ranging from 0.81 to 0.95.

The value of correlated item total correlation of any item not must be less than 0.3 (Field, 2009; Saxe and Weitz, 1982; Bearden et al., 2001) and the lowest value of Correlated-Item Total Correlation is 0.36, which means all the items are having good correlation-item total correlation as the threshold value is 0.3 and all the values above 0.3 are good to pursue further. The normal range of Cronbach’s coefficient alpha value between 0.0 and +1.0, and the higher values reflects a higher degree of internal consistency. The Cronbach’s coefficient alpha was calculated for each construct and is ranging between 0.843 to 0.905.

Construct wise correlation is also checked which concludes that all the items are having high correlations with respect to their constructs and also this study did not find any outliers in the absence of which construct’ Cronbach alpha would be increasing. Hence, we have considered the results from EFA and retained all 27 items to frame six constructs namely: Techno-Overload (TOV), Techno-Invasion (TIN), Techno-Complexity (TCO), Techno-Insecurity (TINS), Techno-Uncertainty (TUN), Academic Productivity (APRO) with 5, 4, 5, 5, 4, and 4 items respectively.

5.2.2. Confirmatory Measurement Analysis

Further, we used SMART PLS-3 to check the convergent and discriminate validity of the scale. Measurement model is used to employed confirmatory factor analysis. Structural equation modelling (SEM) is given a preference over any other software for CFA because of its property to give the specific output for reliability and validity of the constructs, and detailed explanation of Heterotrait–monotrait ratio of correlation for measuring discriminant validity (Henseler, 2017). Ringle et al., (2010) suggested non-parametric assessment criteria, such as construct reliability (CR) must be greater than 0.6 (Hair et al., 2010), items loading must be greater than 0.7 and less than 0.95 ideally, Cronbach α, Dijkstra-Henseler’s rho (ρ), Jöreskog’s rho (ρ) must be greater than 0.7, and average
variance extracted (AVE) i.e. must be greater than 0.5 (Hair et al., 2014, Arya et al., 2019) and must satisfy the minimum requirements (Byrne, 2010; Bagozzi and Yi, 1988). And, according to Table 2, all values are meeting the threshold value of the respective construct.

According to table 3, all 27 items retained in the scale as the value of item loadings is ranging between 0.75 to 0.87, having Cronbach’s alpha value is greater than 0.7. And, there is no convergent validity issue as the AVE values for all the constructs are coming greater than 0.5, and value of construct reliability (CR) is greater than 0.6. Hence there is no issue of composite reliability. For discriminant validity establishment, we have checked with Henseler, Ringle, & Sarstedt (2015) proposed Heterotrait-Monotrait Ratio of Correlations (HTMT) criteria, which helps to estimate the correlation between the constructs. As per table 3, All constructs are well-fitted with the HTMT criteria as values for all constructs is less than .85. (Nunnally, 1978 and Netemeyer et al., 2004, Gold & Arvind Malhotra, 2001, Hair, Hult, et al., 2014, Henseler and Ringle, 2015).

Further, Table 4 shows the cross loadings which helped us to establish that there is no discriminant validity issue among the constructs, as items are having high loading values within their respective constructs.
So, all indicators of the conceptual model were retained as a part of the conceptual model. And, there is no convergent and discriminant validity issues in the model. Hence, we could proceed further for the structural equation analysis.

5.2.3. Structural Equation Analysis

To complete the structural equation analysis, we have used a two stage process, as Techno-Stress (TST) is a second order construct which is a reflective-formative construct, formed with six constructs namely: Techno-Overload (TOV), Techno-Invasion (TIN), Techno-Complexity (TCO), Techno-Insecurity (TINS), Techno-Uncertainty (TUN), which is having a reverse impact on Academic Productivity (APRO). As per the Table 5, there is a significant impact of TST on APRO with the

<table>
<thead>
<tr>
<th>Indicator</th>
<th>TO</th>
<th>TI</th>
<th>TC</th>
<th>TU</th>
<th>TIS</th>
<th>PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO1</td>
<td>0.72</td>
<td>0.22</td>
<td>0.27</td>
<td>0.14</td>
<td>0.19</td>
<td>-0.02</td>
</tr>
<tr>
<td>TO2</td>
<td>0.71</td>
<td>0.16</td>
<td>0.23</td>
<td>0.00</td>
<td>0.19</td>
<td>-0.12</td>
</tr>
<tr>
<td>TO3</td>
<td>0.79</td>
<td>0.32</td>
<td>0.23</td>
<td>0.16</td>
<td>0.13</td>
<td>-0.10</td>
</tr>
<tr>
<td>TO4</td>
<td>0.73</td>
<td>0.05</td>
<td>0.19</td>
<td>0.25</td>
<td>0.11</td>
<td>-0.05</td>
</tr>
<tr>
<td>TO5</td>
<td>0.79</td>
<td>0.03</td>
<td>0.29</td>
<td>0.11</td>
<td>0.22</td>
<td>-0.17</td>
</tr>
<tr>
<td>TI1</td>
<td>0.43</td>
<td>0.74</td>
<td>0.08</td>
<td>0.15</td>
<td>0.07</td>
<td>-0.06</td>
</tr>
<tr>
<td>TI2</td>
<td>0.30</td>
<td>0.69</td>
<td>0.05</td>
<td>0.13</td>
<td>0.00</td>
<td>-0.03</td>
</tr>
<tr>
<td>TI3</td>
<td>0.47</td>
<td>0.85</td>
<td>0.24</td>
<td>0.02</td>
<td>0.19</td>
<td>-0.10</td>
</tr>
<tr>
<td>TI4</td>
<td>0.21</td>
<td>0.86</td>
<td>0.22</td>
<td>0.12</td>
<td>0.10</td>
<td>-0.14</td>
</tr>
<tr>
<td>TC1</td>
<td>0.28</td>
<td>0.24</td>
<td>0.78</td>
<td>0.16</td>
<td>0.34</td>
<td>-0.20</td>
</tr>
<tr>
<td>TC2</td>
<td>0.28</td>
<td>0.09</td>
<td>0.72</td>
<td>0.15</td>
<td>0.42</td>
<td>-0.15</td>
</tr>
<tr>
<td>TC3</td>
<td>0.40</td>
<td>0.28</td>
<td>0.86</td>
<td>0.05</td>
<td>0.43</td>
<td>-0.16</td>
</tr>
<tr>
<td>TC4</td>
<td>0.19</td>
<td>0.08</td>
<td>0.73</td>
<td>0.21</td>
<td>0.46</td>
<td>-0.12</td>
</tr>
<tr>
<td>TC5</td>
<td>0.19</td>
<td>0.03</td>
<td>0.74</td>
<td>0.28</td>
<td>0.44</td>
<td>-0.11</td>
</tr>
<tr>
<td>TIS1</td>
<td>0.24</td>
<td>0.15</td>
<td>0.32</td>
<td>0.14</td>
<td>0.93</td>
<td>-0.20</td>
</tr>
<tr>
<td>TIS2</td>
<td>0.21</td>
<td>0.16</td>
<td>0.39</td>
<td>0.24</td>
<td>0.83</td>
<td>-0.04</td>
</tr>
<tr>
<td>TIS3</td>
<td>0.14</td>
<td>0.05</td>
<td>0.53</td>
<td>0.11</td>
<td>0.81</td>
<td>-0.14</td>
</tr>
<tr>
<td>TIS4</td>
<td>0.13</td>
<td>0.02</td>
<td>0.41</td>
<td>0.07</td>
<td>0.72</td>
<td>-0.13</td>
</tr>
<tr>
<td>TIS5</td>
<td>0.16</td>
<td>0.10</td>
<td>0.34</td>
<td>0.12</td>
<td>0.74</td>
<td>-0.12</td>
</tr>
<tr>
<td>TU1</td>
<td>0.19</td>
<td>0.15</td>
<td>0.21</td>
<td>0.90</td>
<td>0.13</td>
<td>0.23</td>
</tr>
<tr>
<td>TU2</td>
<td>0.17</td>
<td>0.12</td>
<td>0.14</td>
<td>0.83</td>
<td>0.15</td>
<td>0.28</td>
</tr>
<tr>
<td>TU3</td>
<td>0.08</td>
<td>0.04</td>
<td>0.24</td>
<td>0.76</td>
<td>0.15</td>
<td>0.20</td>
</tr>
<tr>
<td>TU4</td>
<td>0.13</td>
<td>0.10</td>
<td>0.11</td>
<td>0.71</td>
<td>0.10</td>
<td>0.29</td>
</tr>
<tr>
<td>PP1</td>
<td>-0.04</td>
<td>0.00</td>
<td>-0.17</td>
<td>0.29</td>
<td>-0.12</td>
<td>0.51</td>
</tr>
<tr>
<td>PP2</td>
<td>-0.15</td>
<td>-0.14</td>
<td>-0.16</td>
<td>0.28</td>
<td>-0.11</td>
<td>0.97</td>
</tr>
<tr>
<td>PP3</td>
<td>-0.09</td>
<td>-0.10</td>
<td>-0.17</td>
<td>0.25</td>
<td>-0.13</td>
<td>0.83</td>
</tr>
<tr>
<td>PP4</td>
<td>-0.12</td>
<td>-0.09</td>
<td>-0.16</td>
<td>0.24</td>
<td>-0.16</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Source: Authors
magnitude value of t-value (2.03) found greater than 2 with p value found less than .05 (.04) with SE value =.07, but the beta value (-0.14) found negative. This analysis helped us to conclude that TST & APRO are significant in causal relationship (TST ® APRO), but inversely connected with each other. Hence Hypothesis H1 is accepted. Table 5 also reveals that there is moderating effect of gender and experience on the causal relationship of techno-stress (TST) & academic productivity (APRO), as the p-value is greater than .05 in both the cases. Hence H2 & H3 are rejected. The results are shown in figure 2 as well.

Figure 2. Conceptual Model with β value

5.3. Qualitative Data Analysis

As detailed in the method section, we extended the probe in-depth by conducting a thorough content analysis of the open ended question by using the NVivo Software. The following themes emerged through our analysis. Quotes from the students are used to strengthen the evidence pertaining to the relevance and existence of these themes.
Qualitative methods explore the perspective and meaning of experiences, seek insight and identify the social structures or processes that explain people’s behavioural meaning (Mays & Pope, 2000).

5.3.1. Themes
Themes emerging from data relating to the research questions are discussed below. Participant quotes were used to strengthen the themes and provide the participants perception towards the research questions.

5.3.2. Research Question
The participants were asked about their expectations from the college to control technostress. This was a way for the participants to recommend ways for smooth learning among students through institutional support and contribution. The following themes emerged from their responses (Figure 3).

5.3.2.1. Flexible Schedules, Deadlines and Time
The highest expectation from the participants was that the institution should be able to offer flexible schedules, deadlines and time. This involves classes, breaks during learning sessions, assignments and projects to avoid much straining. Responses from the participants were; Academic schedule and workload should be designed keeping the current scenario in my mind so as to ensure that the learning does not get impacted and at the same time the techno stress does not impact the creativity and mental health, Avoid back to back and long duration classes, Be flexible and understanding as students are adapting to these new changes, Extend deadline for projects as coordinating within group via zoom call is difficult, Give breaks, Give breaks and allow more time to work on assignments, Keeping the timelines flexible is one thing that can be done, Lectures with necessary breaks in between are helpful. Reduce class frequency in a day to avoid burnout, eye stress and avoid too many readings for a single day as even after full day classes, reading on laptop is tiring, reduce no. of sessions, reduce the frequency of classes within a day.

5.3.2.2. Technology Control and Breaks
The second expectation was that the institution should at least be in a position to control the technology in a way that it does not cause stress among students and also create breaks away from the technology/devices to avoid burn out. Some of the participants were of the opinion that; Can reduce screen timing, Capping digital time per person, Ease the burden or rather reliance on technology, Enable academic activities through reduced screen time, Give assignments that require less screen time. Allow students to switch off their camera and listen during ppt, Give us time off computer, Give us work that does not require to be constantly staring at multiple screens, Let me have some break from online classes and everything, Limited hours of virtual sessions, fixed 1 hour when no emails are sent, Lowering the hours of online engagement, Reduce sessions that consume more screen time, Weekly blackout time where students are motivated to stay away from technology.

5.3.2.3. Reduced Workload
Reduced workload was a major suggestion by the participants. This illustrates that most students are being overwhelmed by school work through virtual and online sessions and screen time as seen from their responses; Be little more empathetic, don’t overload students with never ending assignments which we end up doing for 24*7, Conduct less classes per day, Give less work load, give less work sometimes, Less number of classes in a day, Reduce the burden, Reduce the burden and not keep the workload similar to what used to take place in offline mode, Some consideration towards rigorous academic as more and more screen time is starting to affect the eye sight, Stop overburdening.

5.3.2.4. Inputs from Students, Understanding and Empathy
A strong theme that needs institution attention was that the institution/college should be in a position to take inputs from student, be understanding and empathetic to students. This theme had a strong perception that student’s grievances were not addressed by the institution hence contributing to higher
rate of technology stress. Participants stated that; And a little bit of the understanding and empathy that not everyone is well equipped with the latest and fastest technology gadgets and the anxiety people go through because of that will be a great help for students in these unprecedented times, Be considerate to genuine issues and be lenient, Be considerate towards every segment of people, Be more empathetic, they’ve been very dismissive to the incoming batch’s issues, Be more understanding, Be supportive and understanding. There are times when being at home has its own challenges, sometimes the responsibility of your house is on you and parents are old. Getting a government signed prescription for a sick leave in this scenario is stressful when government hospital near you is a covid centre. Being considerate helps here. People coming from small towns have very less internet speed even though they pay huge monthly bills, even the money we can’t reimburse from loan - just telling students who can afford 20 lakhs MBA can afford all this seems mockery if I was the only earning member and parents are retired. Empathy in this scenario helps. Seek suggestions from students and work towards implementing them plus make the schedule less demanding Support students if they are facing extreme technical difficulties at crunch moments, Take inputs from student feedback and ensure the burden on students is manageable.

5.3.2.5. Physical Interactions, Offline Learning

The suggestion of taking back offline classes and physical interactions came out clearly from the participants so as to balance both online and offline learning. Some of the participants mentioned that; Ask all students to come to campus as the learning is being affected in a way, call back on campus and start regular offline classes, Come at the campus, Conduct more informal sessions and reduce back to back classes with short breaks in between, Except classes, some activities and projects should be such that it should avoid sitting in front of a computer, Give time for study offline.

5.3.2.6. Others

Other emerging themes were the institution to invest in new technology and more reliable infrastructure Better digital infrastructure at place and Use only reliable platforms which will not add burden of learning and stress when the platform fails. Involvement of students in extra-curricular activities, reduce the number of webinar conducted and also have sessions to manage stress, counselling sessions. Lastly some participants suggested nothing should be done from the institution as stated; don’t expect college to do anything about it. It’s part of a change and you have to handle it yourself, it has already helped us control. No new expectations, No other expectations.

Figure 3. Expectations from the institution to control stress

Source: Authors
No correlation was found in responses with regard to gender and years of experience of using ICT (P=0.85).

A wordcloud was generated to visualize the frequency of words used from the source. A 100 words cloud was used. From the results (Figure 4), the most used word was time (n=221) followed by take (n=141). Other words of interest were nothing (n=110), break (n=100), stress (n=91).

![Figure 4. Word cloud of the 100 most frequently appeared words/test from the sources](image)

Source: Authors

6. DISCUSSION AND CONCLUSION

6.1. Need to Enhance e-Engagement

Learning without engagement is unthinkable, and one needs to accept that effective learning is generally the outcome of active engagement. E-engagement is the engagement of students while learning online using technology and involves engagement from three facets: behaviour, cognitive and emotional (Peng, 2017). Research (Twenge, 2017) has proved that the young generation has a preference for communication through social media, texting, and chat.

This study proposes Aristotle’s (Aristotle, 1981) triad of rhetorical appeal to enhance e-engagement of students and control their technostress (figure 5). Research has indicated that impactful interpersonal communication results from effectively applying Aristotle’s model comprising ethos, pathos and logos (Ramage et al., 2015; Xun & Reynolds, 2010, Connor and Gladkov, 2004). Other studies have shown e-engagement through ethos, pathos and logos in communicating in online communities (Otterbacher 2011); and in political campaigns (Bronstein, 2013).

Ethos implies credibility, trust and power; pathos refers to emotions and feelings; and logos is logic through facts and figures. In order to cater to the students’ expectations from the college to control their technostress, an effective use of ethos, pathos and logos can do wonders.
Colleges can allow flexible schedules of classes and be liberal in terms of timelines for project and assignment submissions thereby demonstrating empathy which is a form of persuasive engagement through pathos. Colleges could balance in terms of engaging in lectures, involving the use of ice breaking sessions, giving the students offline work which can be done with or without the use of technology, give interim breaks, providing them inputs on their screen time. The logic of doing this is to facilitate students to keep a check on their use of technology, thereby using logos. Experts could be invited to have interactions, to conduct mindfulness sessions, so that the students learn from the best in the industry thereby indicating the use of ethos.

7. THEORETICAL AND MANAGERIAL IMPLICATIONS

The study succeeds in making several theoretical implications. First of all, the study validates among the students of a management college, the technostress scale suggested by Tarafdar et al. (2007) with minimal alterations. Like other studies (Broos, 2005; Qi, 2019), this study also shows that there is a difference between technostress suffered by males and females. Hence, management colleges need to pay more attention to help control the technostress in females by interventions like digital detox sessions, interpersonal counselling for females. Similarly, technostress also varies with the experience of using technology. It is found that those more exposed to technology find it easier to cope up with technostress than those with less exposure in terms of experience. Therefore, management colleges should facilitate ICT training during the induction of the students to the management programmes. The study also indicates that academic productivity is negatively affected by technostress. These findings are in line with past research (Tarafdar et al., 2011a; Chen, 2015). Therefore, it becomes imperative for management colleges to identify students suffering from technostress and provide them help with regard to controlling their technostress. Motivational talks, engagement through persuasive communication, counselling sessions are few things the colleges may undertake.
Academicians can apply e-engagement techniques to reduce the stress level of students which can help them to improve their academic productivity. The Theory of cognitive learning given by Snow & Lohman (1984) can be improvised further in the context of e-engagement in academic industry. The improvement in learning using information communication technologies to bring various type of techniques for effective teaching and classroom management would reform the academic productivity of the students and academicians too. For this, academicians should understand the learning theories of students and their acceptance level of technologies, which would help them to connect with the students easily.

Bouygues L. H. (2019) concluded through surveys conducted across many countries that institutes and academicians must be careful about the method of technology deployed in classrooms for education purpose. Technology based learning integrated to our education system globally would be very interesting when augmented and virtual realities (AR and VR) are transforming the classroom learning for next-generation. The State of Technology in Education Report states that almost 94% of academicians agreed that involvement of technology in a right way in education improves students’ engagement in learning, enhances their passion for a subject, and motivates them to explore the subject with great interest. On the other side, we need to figure out the constraints students have, their imagination, level of concentration, and determination in learning while engaged in e-learning. All these factors must be studied in depth to make e-learning more successful in future and, to reduce the stress level among students while they are engaged in e-learning. Because, Tech based economy, personalized instructors on virtual platform, availability of high quality content globally, gamified teaching & learning process, advancement in learning from home are going to be the future of teaching and learning system, and we can’t imagine our teaching pedagogy to be of world class standards without involving technology in our education system. The study through its qualitative analysis also strongly emphasises the need of e-engagement and suggests how students appreciate the persuasive communication strategies employed by colleges for their e-engagement.

The findings have managerial implications too. Most of the work is technology-oriented now and while hiring from this age group, companies need to be equipped with training and mentoring facilities to control technostress. The induction of new employees should include the necessary ICT training as well as technostress relieving strategies. Additionally, employers need to employ persuasive communication strategies for stress-relieving e-engagement of their employees in order to have a satisfied and happy workforce.

8. LIMITATIONS AND SCOPE OF FUTURE RESEARCH

The study has some limitations. Firstly, respondents from the same age group across different academic disciplines could have studied for a holistic view of technostress in the said sample instead of focusing students of a management college only. Secondly, the sample data is from one country, so the findings might vary across cultures and countries. Moreover, the study has used only two demographic variables: gender and years of experience using technology, which have limited its scope. Future studies might be conducted across cultures, countries, various academic disciplines, and might include demographic details like: marital status, field of study during graduation, personality types, etc. For a better understanding of the students’ perspectives, the qualitative aspect of the study could have included more open-ended questions like: what do the students do to control their technostress; and what does their family do to control their technostress. This would help in comprehending the efforts taken by students themselves in addition to their expectations from their respective colleges in controlling their technostress, thereby resulting in their own ways and efforts towards e-engagement.
REFERENCES


Byrne, B. M. (2010). Structural equation modeling with AMOS: Basic concepts, applications, and programming (multivariate applications series). Taylor & Francis Group, 396, 7384.


Field, A. (2009). Discovering statistics using SPSS: (and sex and drugs and rock’n’roll). *Sage (Atlanta, Ga.)*.


Deepa Sethi is Professor at Indian Institute of Management (IIM), Kozhikode, India. She is the Chairperson of the two-year MBA in Liberal Studies and Management. With more than 15 years of teaching and research experience, she specializes in Business Communication, Soft Skills, Social Media Communication, Advanced Corporate Communication, Marketing Communication, amongst others. She has published in high impact factor ABDC-A/B category journals. Dr. Sethi has published in high impact international journals, and is the Guest – Editor of various special issues listed in Scopus & ABDC.

Vijay Pereira (PhD) is Full Professor of Strategic and International Human Capital at NEOMA Business School, Reims Campus, France. He is the Associate Editor (Strategic Management and Organization Behavior), *Journal of Business Research* (the number 1 ranked h-index journal for Strategy) and the Global Real Impact Editor for the *Journal of Knowledge Management*. Dr Pereira is also currently an adjunct and visiting scholar at Manchester Metropolitan and Portsmouth Universities, UK and Adjunct Full Professor at the University of South Pacific (USP) Fiji.

Vikas Arya is a doctorate in Digital Brand Management and currently associated with Rabat Business School, Morocco as an Assistant Professor (Marketing), and Founder (Director) - Blueforskning Research Academy. He is having 7+ years of corporate +Academic experience. He has presented his research work more than 40 reputed international conferences, including Egoss-CBS Denmark, American marketing science (AMS) and, American Marketing Association(AMA). Dr. Arya is a Guest - Editor of a special issue of seven International Journals listed in the Scopus & ABDC category. He is having more than 15 articles published in reputed International Journals listed in A-Star / A and B category Journals such as: IJIM & JRCS. He is expert on quantitative data analysis using Smart PLS, Process Macro, ADANCO, NVIVO, F$sQCA$, ANN etc. And, imparted workshops/ training sessions on these Analytical tools Internationally. His core research & teaching interests are in Operation Management, Consumer Behaviour, Brand Management, Personal Branding, Marketing Communication, Destination Branding, Digital Mobile Apps Marketing, Entrepreneurship, Employees Branding, Green HRM practices, etc.