

IMPACT OF TECHNOSTRESS ON VOCATIONAL EDUCATION STUDENTS DURING ONLINE LEARNING IN PAKISTAN

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ABSTRACT

Technostress has been a matter of interest to academic scholars for the last couple of decades. The phenomenon occurs when a person perceives the increasing use of technology as a threat instead of a positive challenge or a new experience of technostress. Recent research studies report that the presence of technostress among professionals has become a factor responsible for affecting performance, productivity, satisfaction, burnout, work-family conflict, and physical or mental health issues. The recent shift towards technology-based learning during the pandemic in Pakistan increased the proliferation of digital devices in academic processes. Online learning due to Covid-19 has compelled students to use technology to join classes and seminars as well as do assignments and assessments online. This becomes a matter of further concern in vocational education as excessive use of technology may lead to technostress among students if they perceive technology as a threat. This study aims to explore the impact of technostress on students' productivity, satisfaction, and commitment to vocational education. To serve this purpose, a sample of 300 students from vocational education programs was collected, and different quantitative tests were performed. The results obtained from statistical analysis showed that despite facing technostress, students were satisfied and committed to their program of study. They had no intention of leaving their ongoing learning. As per the results, the productivity of the students of vocational education was not affected by technostress.

Keywords: Technostress, Online education, Vocational training, Students' performance, Students' productivity

INTRODUCTION

Technology-based learning is a popular approach in the recent era. Technology-based learning has numerous benefits, i.e., distant learning, blurring boundaries, access to quality education, access to worldwide learning material, reduced cost, efficient administration, diversity, cross-cultural interactions, and a transparent system. Teachers, students, and universities are all beneficiaries of the technology-based learning system. Technology serves countless benefits in an individual's life, but some severe hazards of technology cannot be ignored. One of them is technostress. Technostress is a type of stress associated with technology (Tarafdar, Cooper, & Stich, 2019). It can also be described as the inability of a person to cope with it. Feelings of threat, insecurity, anxiety or fear due to the increased proliferation of technology can also be termed technostress. These feelings can affect the performance of an individual. The literature on technostress reports the impacts of technostress on performance, commitment, satisfaction, physical or mental health, behavior, productivity, job security, burnout, etc. Detailed study of literature exposes the dearth of technostress studies in the educational sector, specifically studies related to the impacts of technostress on students.

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Vocational education is an outcome-based approach. It is a type of education that enables learners to learn any technique, skill, or knowledge and prepares a labor force per market requirement (Pirzada, Muhammad, & Ahmed, 2021a). This enhances the chances of job placement and entrepreneurship (Pirzada, Muhammad, & Anis, 2020; Pirzada, Muhammad, & Masood, 2021; Tilak, 2003). Technological advancement and new production processes require a particular skill set to survive in the market, and vocational education serves this purpose (Pirzada, Muhammad, & Mahmood, 2022). Before Covid-19, a lesser number of institutes were using a technology-based approach (Pirzada, Muhammad, & Ahmed, 2021b). During Covid-19, the closure of schools, universities, and lockdowns forced institutes to adopt technology-based learning systems. The sudden shift to online education was shocking for students, teachers, and universities, especially in Pakistan (Hani, Naz, & Muhammad, 2021; Naz, Hani, & Muhammad, 2020). Teachers, students, and vocational institutes in Pakistan are still trying to cope with this change and adapt to new processes (Arshad, Muhammad, & Waqar, 2022; Sharjeel, Muhammad, & Waqar, 2022; Zafar, Muhammad, & Bokhari, 2022). This sudden exposure to new technologies, adopting new processes, and difficulties in implementing the strategy can cause technostress among students.

The existing literature shows a gap in student-centric studies. A very limited number of studies investigate the impact of technostress on students in the vocational stream of education & training. This gap should be filled as it plays a major role in technology-based learning success (Qi, 2019). Another reason contributing to the importance of studying this phenomenon is Covid-19. The education sector is adversely affected by the pandemic. The stress is increasing due to the prolonged closure of institutes and the sudden shift towards technology-based teaching and educational work (Estrada-Muñoz, Castillo, Vega-Muñoz, & Boada-Grau, 2020). Schools, colleges, and university closures occurred around the globe, including countries in Asia (India, Indonesia, Pakistan, Philippines, Qatar, and South Korea), Europe (Ireland, Italy, Luxembourg, Moldova), Africa (Egypt, Kenya, Nigeria, Oman) and America (American States, Argentina, Brazil, Chile) (Christian, Purwanto, & Wibowo, 2020). The gap created because of the institute closure was filled by the use of technology-based approaches to learning. However, the sudden use of technology at an increasing pace can cause technostress among students. Technostress in students can affect performance, productivity, creativity, and the dropout ratio. A person's personality, attributes, and tech-savvy attitude plays a significant role in controlling their stress level. Generation Z is the generation of technology (Robinson, 2018). It is, therefore, significant to study the impact of technostress on this generation. This study investigates the impact of technostress on the productivity, commitment, and satisfaction of vocational education students. The objective of the study is: To examine the impact of technostress on vocational education students. The main research question is: Does technostress impact the productivity, commitment, continuance commitment, and satisfaction of students?

REVIEW OF LITERATURE

Technology has become the epicenter of modern life. Every aspect of modern life depends on technology. Dreams of the past have become the present reality with the help of technology. Everything from personal to professional life, household to office, health treatment to travel, and recreation education entails technology. The education sector is changing rapidly by adopting the latest technologies. Education institutes are embracing technology to impart a better quality of education and to increase the number of students.

Along with the conventional mode of education, some new ways are also being tested. Worldwide, different institutes are adopting a technology-based learning system. A technology-enhanced learning system (TEL) or technology-based learning system is any system of learning assisted by technology. This includes online courses, online classes, exams, assignments, meetings, and discussion forums. Some prominent examples include Massive Open Online Courses (MOOCs), Education-Portals, the Monterey Institute for Technology, Education's National Repository of Online Courses, and Carnegie Mellon's Open Learning Initiative (Booker, Rebman Jr, & Kitchens, 2014).

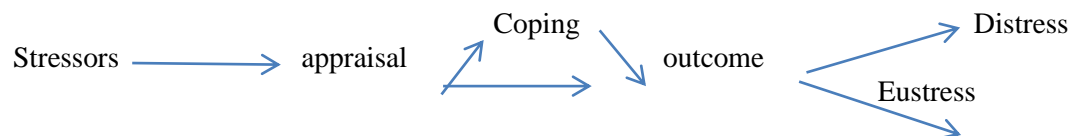
This approach is becoming popular worldwide as it helps remove barriers and makes education accessible for all. Substantial benefits of this approach are flexibility, blurring geographical borders, diversity, cross-cultural interactions, time and cost efficiency, greater access to quality education, and the number of students. However, it can be stressful due to the greater demand for time management, updated gadgets, new software, self-learning, and mental acceptance of an unconventional education

system (Qi, 2019). Stress is defined as disruptive conditions creating a state of disturbed equilibrium between a person and their environment (Tarafdar et al., 2019). The stress induced because of technology is referred to as technostress.

Technology is a highly demanding aspect of life. It is continuously changing and updating. A person's inability to cope with the increasing demands of technology causes technostress (Jena, 2015). Technostress was defined by Wang et al. as "a reflection of one's discomposure, fear, tenseness, and anxiety when one is learning and using computer technology directly or indirectly that ultimately ends in psychological and emotional repulsion and prevents one from further learning or using computer technology" (K. Wang, Shu, & Tu, 2008). Technostress can also be defined as a feeling of fear and anxiety resulting from a negative psychological state while using technology. It can also be defined as stress created due to digitalization and the technological revolution. Multiple reasons for technostress are computer hassle, information overflow due to mobile technology, multitasking, privacy violations, technical problems, continuous updates, cyberbullying, data malfunctioning, lack of training, role conflict, workload, and constant availability (Tarafdar, Pullins, & Ragu-Nathan, 2015).

From the existing literature, it is evident that a person perceives stress in a certain environment. Technostress is studied based on the person-environment fit model. An individual's personality, attributes, and environment all contribute to stressors or triggers. Either individually or interdependently, personality traits significantly affect a person's perception. The personality's behavioral and cognitive aspects contribute to perceived stress. While studying the technostress, the person-environment fit has been applied to the person-technology (P-T) fit (Ayyagari, 2012).

Technological proliferation and advancement cannot cause technostress if an individual feels comfortable in the environment. The perception of a person plays a significant role in controlling stress. If an individual perceives any stressor as a threat, this will ultimately lead to stress. While perceiving stressors as a challenge can increase motivation and create eustress (good stress), an individual personality trait and mindset contribute to perceived stress (Tarafdar et al., 2019). Proactive and emotionally intelligent people are less likely to suffer from stress. They perceive stressors as challenges and turn triggered situations into opportunities (Hung, Chen, & Lin, 2015). An individual's appraisal and coping strategies to reduce stress levels also include the individual's emotions based on appraisals (Issa & Bahli, 2018). According to Lazarus and Folkman's (1984) transactional theory, appraisals and coping strategies of an individual are responsible for the outcome being either distress or eustress.



Eustress is a term proposed in 1950 by Hans Selye, known as the father of stress studies in the literature. Eustress or good stress is optimum levels of stress that do not negatively impact individuals but rather boost their confidence, commitment, productivity, satisfaction, etc. (Bahar, 2019). Various studies in the literature explored the positive impacts of controlled or optimal stress. The careful proliferation of technological advancement with proper training can reduce technostress and its impact on individuals. The proven benefits of technology are ease and efficiency in a person's life by mitigating the impacts of stress (Robinson, 2018).

Job demand beyond an individual's capacity, especially in terms of technology, creates technostress. Technostress comprises five dimensions: techno overload, techno uncertainty, techno invasion, techno complexity, and techno insecurity (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). 'Techno overload' can be defined as information flow from different technological sources that can cause information overload and enhance the chances of misinformation, increased workload, and constant updates. 'Techno uncertainty' relates to the fear of losing data or information in case of technological malfunctioning, hacking, breach of privacy contracts, and unauthorized. 'Techno invasion' relates to the constant availability to connect anywhere, anytime. This increases stress due to the blurred boundaries between working hours and personal time or vacations. 'Techno complex' relates to the complexity of technology, along with constant updates, new software versions, inappropriate training, or sudden workflow discontinuity due to errors, threatening individuals or organizations. These threats and pressures are one of the primary sources of technostress. 'Techno insecurity' relates to

technology causing job insecurity among people. The fear of being replaced by those who have a better understanding of technology enhances the stress level of employees.

Different dimensions of technostress have different impacts on people. A study reported that techno invasion, techno complexity, and techno overload are positive; however, techno insecurity and techno uncertainty are negative (Hatimtai & Hassan, 2018). The literature also identifies some techno inhibitors. Techno inhibitors contribute to saving individuals from technostress even in high-tech and digitalized environments. Techno inhibitor includes training, organizational support, incorporating employees' suggestions and perceptions before implementing the technology, and the tech-savvy attitude of individuals. It is reported that individuals feel less stressed when properly trained and taught (Adekunle, Omoba, & Tella, 2007). It is noted that technology-oriented changes should not be seen as overwhelming due to their drawbacks, as it has both positive and negative effects (Ahmad, Amin, & Ismail, 2014).

Technostress is an impactful phenomenon, and literature illustrates the relationship of technostress with performance, productivity, satisfaction, mental and physical health, burnout, absenteeism, conflict, isolation, turnover, etc. A study reveals that technostress is related to insomnia and memory disorder, resulting in absenteeism (Chiappetta, 2017). Salvona suggested that technostress generates skepticism and inefficacy in employees. Another study reported that workload and constant availability are the main reasons for technostress (Ennis, 2005). Technostress shows a negative relationship with job satisfaction and commitment (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008). One other study revealed that technostress results in psychological and behavioral disorders (La Torre, Esposito, Sciarra, & Chiappetta, 2019). A study on librarians in Kuwait highlights a positive aspect of technostress that enhances job performance (Al-Qallaf, 2006).

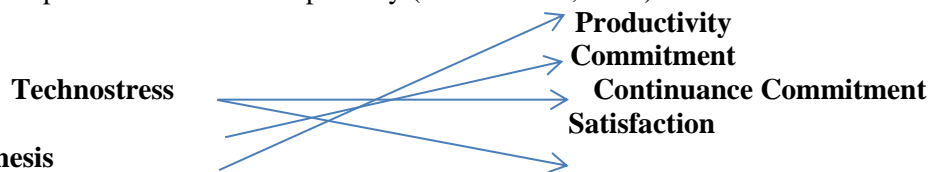
Another study suggested no impact on performance because of technostress (Priluck, 2004). Veitez et al. (2001) revealed that a high level of job insecurity and stress is present in employees due to rapid changes in technology. Insecurity and stress can drastically impact an employee's well-being. Technostress has a wide range of impacts. Studies suggest that technostress affects psychological behavior. One of them is employee productivity (Sarabadani, Carter, & Compeau, 2018). Laspinas (2015) revealed that there is always a pressure to do more due to the all-time availability of mobile devices enhancing an employee's workload. Another study reported that technology had become one of the main reasons for workplace stress (Robinson, 2018). Incorporating the broader picture, a research study suggested that burnout is not solely the outcome of technostress. Rather, individual perception of technology being helpful or harmful controls the feeling of burnout (Grzywacz, Almeida, & McDonald, 2002).

Technology benefits every sector. In academia, technology is used for various purposes, i.e., student service, administration, information handling, database management, etc. Universities and colleges are incorporating more and more technology to excel in the market, connect with the digital world, meet the expectations of students, reduce paperwork, and oblige government regulations (Deming, Goldin, Katz, & Yuchtman, 2015). Students are also beneficiaries of the increasing technological use, i.e., access to learning material, joining online classes, and reduced geographical barriers. Technology helps impart quality education and transparency in admission, aids in the attendance and grading process and provides efficiency in the administration sector (Hatimtai & Hassan, 2018). While discussing technological benefits, the stressful impact of technology cannot be ignored. A person's inability to cope with technology has overarching impacts, and it is studied in various fields, but literature shows a scarcity of studies regarding technostress in the educational sector.

The current literature on technostress in the educational sector is, by large, teacher-centric. A recent study suggested that technostress negatively impacts teachers' job performance depending on age and workload (X. Wang & Li, 2019). An investigation revealed that 1 out of 10 Chilean teachers is at psychological risk due to technostress. Findings also suggested that male teachers are more at risk (Estrada-Muñoz et al., 2020). Another study suggested that teachers are stressed when they use technology in classrooms. The reason for this stress can be the teacher's inability to cope with technology, the lack of technological support provided by the organization, and an unhelpful environment around that teacher (Al-Fudail & Mellar, 2008). Davies (2015) revealed that students experience anxiety, computer fear, and technostress during their first exam. A study regarding virtual teams revealed that a virtual team must work efficiently and effectively. They must start and end in time. They often bear more work pressure (Munkvold & Zigurs, 2007).

Conceptual framework

This conceptual framework is inspired by (Booker et al., 2014).



Hypothesis

- H1 Technostress has an impact on students' productivity.
- H2 Technostress has an impact on the students' commitment to their program of study.
- H3 Technostress has an impact on the continuance commitment of students.
- H4 Technostress has an impact on students' satisfaction.

METHODOLOGY

Nature of research

The research design used in this study was quantitative and cross-sectional, aiming to investigate the impacts of technostress on the productivity, commitment, and satisfaction of students of vocational education. This study focuses on the explanation and analysis of the facts and figures with the help of statistical models.

Data collection & sample

The targeted population of this research is the local students who were enrolled in various vocational training programs, including Fashion Design, Interior & Architectural Design, Textile Design, and Graphic Media Design at STEP Institute of Art, Design & Management, a leading private vocational training institute located in Lahore. To obtain more generalized results, a sample of 342 participants was selected through purposive sampling, as evident from the selection of the population. As the students were learning and taking classes online due to Covid-19, the research questionnaire was filled in a non-traditional way, i.e., online. The research questionnaire was shared via Google form with 342 students of Graphics Media Design, Interior & Architectural Design, Textile Design, and Fashion Design. The respondents included 157 male participants and 185 females between the age group of 18 to 25. All these participants expressed their views on the impacts of technostress on their commitment, satisfaction, and productivity.

Instrument

To accomplish the objective of the research, the data were collected through online questionnaires as the survey tool. To obtain generalized and quantifiable results, a standardized set of statements were used to measure the variables. As the respondent had to fill out the questionnaire, it was designed to be self-administered. The questionnaire was divided into two sections. The first section was to measure the demographic attributes such as gender, age, etc., and the second section was to measure the variables, i.e., technostress, productivity, commitment, and satisfaction.

Technostress

This study used the 20-item questionnaire of technostress developed by Tarafdar et al. (2015). This questionnaire included the five dimensions of technostress, i.e., techno overload, techno complexity, techno invasion, techno insecurity, and techno uncertainty. All the items were written in the form of statements so the participant could easily respond on the given scale. A 5-point Likert scale was used to measure all the items. The scale included statements like *"I am forced by this technology to work much faster."*

Productivity

A 4-item scale, developed by Tarafdar et al. (2015), was used to measure the productivity of participants. All items were measured on a 5-point Likert scale. The scale included statements like *"This technology helps to improve the quality of my work."*

Commitment & Satisfaction

The scale for commitment and satisfaction was adapted from (Booker et al., 2014). This scale included three dimensions, i.e., Programme Satisfaction *"(I like doing the things I do in the program.)"*, Program Commitment *"(I would be happy to graduate from this program)"* and Continuance Commitment *"(Too much of my life would be disrupted if I decided I want to leave my program right now)." All the items were measured on a 5-point Likert scale.*

Out of 342, 300 questionnaires were properly answered. Using a quantitative approach, different statistical analysis techniques were performed.

RESULTS

Reliability

The reliability of a scale shows its consistency. The reliability of the given measures was estimated through Cronbach Alpha. The Cronbach alpha coefficient usually ranges between 0 (no reliability) to 1 (perfect reliability). The reliability analysis showed that all the scales used in the study were reliable. The value of Cronbach’s alpha was above 0.6, which is the minimum acceptable value (Taber, 2018). The reliability of the technostress scale was 0.898, students’ satisfaction was 0.781, students’ commitment was 0.831, continuance commitment was 0.676, and the productivity scale was 0.896. Results of the reliability analysis showed that all the scales used in this were reliable.

Normality

To obtain significant results, the data needs to be normal, and for this purpose, Shapiro-Wilkson’s test was applied. The test ranges the value of p to be below 0.05. If the value is below 0.05, it means the data is normally distributed. The results of the Shapiro-Wilkson’s test showed that data were normally distributed. All four hypotheses were accepted. Technostress has a significant relationship with students’ productivity, satisfaction, and commitment.

Correlation analysis

The correlation coefficient is used to test the relationship between the variables. As shown in Table 1 below, the results of correlation analysis showed the significant relationships of technostress with students’ productivity, satisfaction, and commitment. Pearson’s r correlation test was carried out to test the significant strength of the existing relationships among variables. The result shown in the table indicates that the relationship is positively significant, which means the increase in technostress causes an increase in productivity, satisfaction, and commitment, while most of the literature shows opposite negative trends.

Table No. 1: Correlation of technostress with students’ satisfaction, commitment, and productivity

	Satisfaction	Commitment	Continuance Commitment	Productivity
Pearson Correlation	.248**	.252**	.403**	.116*
Technostress Sig. (2-tailed)	.000	.000	.000	.044
N	300	300	300	300

**Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed)

Regression

The objective of the study was to determine the impact of technostress on the productivity, satisfaction, commitment, and continuance commitment of students in the vocational educational stream. The correlation analysis showed that there exists a significant association among the given variables. However, it doesn’t explain the causal relationship between them. That is why regression was tested to explain the causal relationships among variables. The regression analysis showed the impact technostress created on students’ performance, satisfaction, commitment, and continuance commitment. Regression analysis showed that technostress creates a 1% variance in productivity, which means technostress enhances the productivity of the students by 1%. In general terms, it can be reported that technostress due to technology-based learning systems has no significant impact on students’ productivity. According to the participating students, their productivity remains almost the same in online classes as in conventional classes. A similar type of result was reported by an earlier study (Nicol, Owens, Le Coze, MacIntyre, & Eastwood, 2018). In terms of satisfaction, technostress has an impact of 5.8% on students’ satisfaction. This means students were 5.8% more satisfied during their online classes. The commitment of the students to their ongoing programs increased up to 6.1% due to technostress. Technostress causes a variance of 16.1% on continuance commitment. Results reveal that students’ commitment to continue their ongoing program was enhanced by 16.1% due to the use of

technology-based learning. Technostress leaves positive impacts on students as technology-based learning helps continue the learning process without causing any fear.

DISCUSSION AND CONCLUSION

This study aimed to explore the impact of technostress on students' productivity, satisfaction, commitment, and continuance commitment. The results show that technostress positively impacts students' productivity, satisfaction, commitment, and continuance commitment to their programs in a technology-based learning environment. The students reported enhanced productivity and satisfaction. They also report greater commitment to their ongoing programs of study and have no intention of leaving their current training program. The results contradict the general trends of literature as literature showed a negative impact on performance, productivity, and commitment. The negative impact of technostress is shown in the results of studies in different populations, majorly among employees. There could be multiple reasons for this contradiction. The first and major reason is that technostress has been a limitedly researched area in the education sector, especially in students, generally in mainstream education and specifically in vocational education. Stress is a phenomenon greatly affected by perception, and technology as a stressor can leave negative impacts on students only when students perceive it as stressful. Being a member of Generation Z, students have the traits that help them in adapting to any advancement and coping with it. Age is the major factor in reducing the impact of technostress, as young people are energetic, enthusiastic, flexible, and passionate about learning new things, while older people are usually rigid and conventional. People above 35 are usually more stressed (Tu, Wang, & Shu, 2005). Computer literacy also contributes to increasing or decreasing technostress. Young people are usually proficient in the use of modern technology. They have been using smartphones, computers, and other digital gadgets from comparatively an earlier age and thus have established computer literacy (Inaltekin, 2020). They perceive technological problems as a challenge instead of a threat (Beaudry & Pinsonneault, 2010). Perceiving problems as challenges and bearing stress to overcome these challenges results in enhancing the feeling of eustress, problem-solving approach, and creativity (Le Fevre, Matheny, & Kolt, 2003).

The second major reason for these contradicting results is the perception of the attributes of a person. Students are in their learning phase. Their routines and mindset are apt to the learning process. Moreover, they are in the age group where challenges attract people. There is a lot of difference between the lifestyle of current students and students of the previous decade. They are called Digital Natives, Generation Net, or Millennials by different researchers. They are born and brought up in a technological environment. Hence, they adopt technology easily (White et al., 2014). They like learning new aspects and applications of technology. Learning aptitude, tech-savvy attitude, proactive personality, computer literacy, etc., all played a significant role in diminishing the negative impacts of technostress. Moreover, technostress bounds students to complete their projects and submissions in time. Approaching deadlines and enhanced pressure force students to follow a time schedule. In this way, technostress helps students battle procrastinating.

The third major reason could be Covid-19. One of the effective ways to reduce the spread of disease is social distancing (Courtemanche, Garuccio, Le, Pinkston, & Yelowitz, 2020). Using technology-based learning during the period of Covid-19 and institute closure is an efficient step in reducing the spread of the disease. This reason creates a positive acceptance of technology-based learning in students. Students face technological problems but do not perceive them as a threat because their impact is nothing compared to disease. The anxiety and stress factor of the disease is large enough that technostress leaves no impact. Technostress is the small cost students are willing to pay to avoid the contagion of disease. Technology-based education helped in the continuity of the education process during the suspension of on-campus classes. It leaves positive impacts on students' productivity, satisfaction, commitment, and continuance commitment as students participate in the learning process without any fear.

The result of this study is very useful for future researchers as it provides a different aspect to study. Future researchers can use this study as a base and incorporate further aspects of students' performance and behavior. Coping strategies used by the students to change distress into eustress can be explored. Organizational support and cultural perspectives can also be incorporated into future studies.

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