Exploring Themes of Technostress for End Users Working with Hardware and Software Technology

Ronald Bradshaw and John A. Zelano, Ph.D.
School for Advanced Studies
University of Phoenix, Phoenix, Arizona, USA

Abstract

Technology in the workplace is widespread in order for an organization to conduct business operations routinely. Technology allows the end user to experience work overload by taking on many projects and work stoppage from misconfigured computers, outdated devices, and network outages. Work overload (techno-overload) and stoppage because of technology has spurned a new terminology from work related stress termed technostress. This study explored end user feelings about working in a technological environment and the technostress created therein. Twenty-five participants, including five pilot participants, shared lived experiences about their work environment produced from working with technology systems, how leaders in the organization assisted in achieving project goals, and how the demands of technology influenced the work culture. The data analysis of face-to-face interviews was conducted by using NVivo 9 software which resulted in six extracted themes. The themes of leadership and communication explored how end users feel about leadership support. The theme, trusting computer users to manage simple updates, explored how end users felt about having a lack of control over managing technology needs. The theme, organizational culture and the work experience, explored organizational culture within various companies. The theme, dependency on technology, explored the dependency on technology that the workforce encountered which was not a factor several decades ago. The theme, submission to policies concerning technology in the workplace, explored how strict computer policies affected end user feelings. The theme, dominance created by the purpose of technology design, explored the feelings of the end user's acceptance of the work environment created by the demands of protecting technology resources. Understanding these themes can guide technology developers and organizational leaders to create and improve the organizational work environment producing a more user-friendly workplace that inspires workers and increases work efficiency. The results and recommendations of this study regarding technostress on end users can guide future

organizational development, management, and leadership to create an optimum workplace for users of hardware and software technology (HST) based systems.

Introduction

Hardware and software technologies (HST) contain technology that runs applications and manages equipment that connects computer devices to the wide area network (WAN) that transmit data to perform tasks. Technology systems enabled people to multitask from almost any location in the world and assumed more job tasks than any previous generation of workers (Tarafdar, Tu, & Ragu-Nathan, 2010). Computers have software applications that enable the end users to perform various tasks that include creating presentations, communicating by e-mailing, interacting with databases, and providing services to customers. Technology allows the end user to experience work overload by taking on many projects and work stoppage from misconfigured computers, outdated devices, and network outages (Tarafdar et al., 2010). Work overload (techno-overload) and stoppage because of technology spurned a new terminology from work related stress termed technostress (Tarafdar et al., 2010).

Technostress relates to information overload that causes the inability of employees to cope with organizational computer operability and technology interruptions from faulty systems (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008). Learning new technology also contributes to technostress (Ragu-Nathan et al., 2008). The computer age played a role in creating overworked employees resulting in high stress that caused collateral influences on society affecting work relationship, personal relationship, and health implication (Tarafdar et al., 2010). Technostress is work related stress that focuses on stress endured by people who work with hardware and software technology (HST) and is a new and understudied field of research (Tarafdar et al., 2010). The focus of this study was on the end user's (participants) adjustment to technostress, leadership commitment to the end users for increasing efficiency in the workplace, and to satisfy end users using computer devices to complete tasks (Tarafdar et al., 2010).

This study was significant because it creates new knowledge for an understudied research of end users' satisfaction and technostress. Examining the lived experience of participants by conducting a qualitative phenomenological research provides valuable information of the influences of technostress on end users. The investigator of this qualitative phenomenological study intended to use a modification of the Van Kaam method to transcribe the interviews, record a semi-structured interview, and identified themes from NVivo 9 (QSR International., 2011).

Background

Work related stress affects morale in the workplace, health issues resulting in an increase of use of sick days, and retention of valuable employees (Netterstrøm & Bech, 2010). Technostress correlates to work related stress caused by the ability of technology that increased the end user's workload (Tarafdar et al., 2010). Tarafdar et al. (2010) stated that techno-

overload developed from end users multitasking, taking work home, and HST failures. Slow networks, network outages, outdated equipment, and inconsistent data retrieval are major problems that hinder the ability of end users to support an organization with maximum efficiency (Fleishman, 2009). Throughout the beginning of the computer era, computer designers increased the speed of computers to store and process data to complete tasks (Aspray, Shustek, & Ryska, 2010).

Poor coordination between organizational leaders and the IT team that implements HST may disrupt an organization from optimizing work output. Miscommunication between senior leadership and the organization on HST needs lessens the effect for the organization to provide ideal customer service. Leaders who fail to provide leadership to ensure that end users receive training for new HST risk slowing down daily operations productivity.

This qualitative phenomenological method provided the ability to clarify and understand the background of the problem by conducting interviews with participants who share their experiences using technology in the workplace to complete tasks. Wertz (2005) stated the investigator listens to the participant empathetically and without bias. Interviewing participants lived experiences on using technology in the workplace provided the investigator of the present qualitative phenomenological study with information for analysis. Analysis consists of participants interviewed about their HST environment and organizational leadership using interview questions and the NVivo 9 software analysis tool for extracting keywords validated by the investigator after the pilot study.

Theoretical Framework

Theoretical framework, also known as a paradigm or a theoretical system, is similar to an abstract as opposed to a formal or substantive theory (Neuman, 2003). Theories existing in the same framework share assumptions and key concepts (Neuman, 2003). The broad theoretical framework consisted of technostress in the workplace, transformational, servant, trait leadership theories, and the effect of HST failure in the workplace environment.

The focus of the first theoretical study was on technostress. Technostress is a new and understudied topic originating from the study of work related stress that focuses on stressors in the technology environment (Tarafdar et al., 2010). Technostress results from the how an organization employs HST systems that affects individual experiences (Weil & Rosen, 1997).

Work overload and faulty HST systems contributes to technostress (Ragu-Nathan et al., 2008). Ragu-Nathan et al. (2008) described technostress creators as events and situations associated with stressors. The present qualitative phenomenological study added knowledge to the gap in literature by providing an addition of six new stressors and expanded the depth of understanding technostress.

The second theoretical study consists of transformational leadership, servant leadership, and trait leadership. Managing work related stress needs skilled leaders to recognize stressors and implement plans to reduce stress to improve efficiency (Skakon, Nielsen, Borg, & Guzman, 2010). Transformational leadership provides change in the organizational culture through charismatic leadership (Bailey, 2001). Leaders showing transformational leadership qualities motivate employees through a series of steps to increase morale and job performance (Bailey, 2001). Transformational leadership allows managers to encourage end users to become proactive in reducing technostress by communicating one-on-one and in groups to brainstorms ideas to improve morale in the workplace.

Servant leadership is placing the priority on team members by providing resources to the organization without seeking rewards in return (Black, 2010). Polleys (2002) stated that servant leaders achieve success for the organization by removing obstacles that prevent the employees from increasing their potential. The present research study strove to learn how leaders effectively managed technostress of end users working with HST to complete tasks.

The focus of trait theory is on temperament traits rather than personality traits (Piekkola, 2011). However, several behaviorist experts disagreed with the trait theory and attacked the trait system for having inconsistent data (Piekkola, 2011). Traits become apparent in situations and when an event occurs that registers as weak, the trait remains constant; however, when the event increases, the traits change (Piekkola, 2011). The trait theory matches to the study how leaders and end users deal with technostress when HST failure occurs.

The third theory for the current study was examining the variety of HST components in the workplace and the effect HST systems have on end users' satisfaction. Despite the sophistication of powerful HST systems, work overload, computer failure, and network disruption continue to lessen the satisfaction level experience by end users (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). Besides the current technostress mentioned by Tarafdar et al. (2007), the intent of the present qualitative phenomenological study was to seek to identify these elements in the common workplace as described by interview participants.

Pearson, Pearson, and Griffin (2009) noted that frequent upgrades of hardware or software (techno-complexity), processing excessive information and misconfiguration of HST (techno-overload), poor task-related decision-making in network design (techno-uncertainty), fear of being replaced by advanced technology (techno-insecurity) and taking work home (techno-invasion), increase technostress that lessens the satisfaction of end users working with HST systems.

Skakon et al. (2010) stated that work related stress is the second largest problem that affects employees. The information technology (IT) department for an organization remains the primary source for ensuring the end users have the ability to process information workflows (Grandhi, Jones, & Hiltz, 2005). Chang and King (2005) posited the importance of the end user

satisfaction with applications and the systems used to conduct daily business efficiently. Yaverbaum (1988) stated that research of technostress in the HST systems is rare, yet emerging.

Results

The purpose of this qualitative, phenomenological study was to develop an understanding of the effects of technostress and technology systems on end users satisfaction that used HST systems to complete job tasks in Cheyenne, Wyoming. The purpose of the study was to seek to understand current technostress further consisting of techno-complexity, techno-insecurity, techno-invasion, techno-overload, and techno-uncertainty.

The study included the use of the modified van Kaam method through a transcribed recorded face-to-face and telephone interview. The rapid development of software and technology devices required end users to learn how to do their job tasks differently. The advancement of software editions and upgrades requires that faster processors as computers become bogged down when end users operate multiple programs simultaneously. End users rely on the organization's management department to develop information technology (IT) support and rarely have any influence on the type of HST to implement in the organization.

After the pilot study was conducted, an advertisement was placed in the Wyoming Tribune Eagle (WTE) with an invitation for individuals to participate in the study. Eighteen participants responded to the advertisement with seven who qualified and agreed to participate in the study. Eight participants who did not have access to the WTE were notified that an e-mailed scanned copy of the advertisement would be sent to their inbox. The snowball sampling strategy netted five additional participants for the study for 20 participants.

In classifying essential features of end users technostress based on participants accounts, the three general categories of leadership, procedures, and organizational culture were identified with several subcategories. Based on the information gathered from participants, technostress affects end users in various ways as revealed from the answers to the questions. According to the study participants, each category contains elements critical to technostress.

The end users responding to the advertisement to participate were of a wide range of diversity. Participants indicated that they were between the ages of 26 and 67 and occupations included end user, manager, and end user with basic IT skills. Participants identified themselves as African American, White, and Latino.

Research Questions

The six primary research questions consisted of the following:

1.   How do leaders in your organization exhibit transformational and servant leadership traits to encourage members in the organization to adapt to constant changes in HST?

2.   How do end users, managers, and leaders in the organization who use HST to complete job tasks meet goals when HST failure occurs suddenly?

3.   How do end users in the organization communicate needs relating to technology such as computer training and faster computers to managers and leaders?

4.   How do end users, managers, and leaders in the organization prepare for scheduled network outages?

5.   How do end users interact with the IT support staff for high priority problems?

6.   How do end users report computer malfunctions that occur in the workplace?

The questions used in the interview addressed the issues raised in the research studies. The pilot study gave the ability to query the participants in a neutral tone and to speak with clarity. None of the questions needed alteration for the main study.

Data Collection

The qualitative, phenomenological approach consisted of collecting data to learn about technostress through the lived experience of 20 end users satisfaction from working with technology systems from word for word transcription. The end users are employees who enter and retrieve data into computer devices, serve as leaders in the organization, and IT professionals. All necessary consent and confidentially forms were obtained with user permission.

The data collection consisted of notifying potential participants of the proposed study by e-mail, posted an advertisement in the newspaper for seven days, and used a snowball sampling strategy to recruit potential candidates. Potential participants responded to an advertisement in the Wyoming Tribune Eagle (WTE) newspaper. The pilot study (three women and two men), participants that were not located in Cheyenne, Wyoming, were e-mailed a copy of the advertisement used in the WTE.

The pilot study revealed the tone, speed of talking, and timing to allow participants to respond to the questions. All participants answered the first two questions that screened potential participants to participate fully in the present study. The participants consisted of 15 women and 5 men. The participants were given a choice of having the interview recorded. The interview process ceased after the investigator determined that new data did not add information for the developing of categories.

Pilot Study Findings

The pilot study had five participants involved in testing and validating the interview protocol. The five individuals were end users who use computers to conduct tasks. The pilot test provides the ability to revise interview questions and make final decisions about the study. The adjustment was asking the questions with a clearer and deliberate tone that allowed the participant to fully understand the question. Feedback provided by pilot study participants is not a part of the study.

Resolving scheduling conflicts to conduct interviews became an important benefit of the pilot study. The pilot study demonstrated the actual period of conducting interviews. The initial period called for the interview to last 60 minutes. However, the average interview time was 21 minutes. The core themes in the final study were the same as the themes in the pilot study. Other than comparisons of analysis, the pilot study is not a part of the main study data.

Demographic Characteristics

After completing the five interviews conducted for the pilot study, interviews of 20 participants for the present study were conducted. The range of ages was 27 through 67, with positions as end users, managers, and IT specialists. The difference in age and variety of positions of the participants provided the opportunity to conduct interviews that provided various perspectives of the technology in the work environment.

However, for this qualitative phenomenological study, careers from the participant's perspective provide the area of interest for the qualitative, phenomenological study. All 20 participants qualified as end users for using HST systems to complete job tasks. Six participants worked in the role of supervisor, leader, or manager and eight participants had roles with IT responsibilities. Table 1 shows the demographic breakdown of the participants:

Data Analysis

The lived experience of participants examined through a defined process to produce meaning provided the basis for a successful qualitative phenomenological study. The analysis of data followed the modified Van Kaam method is shown in Figure 1. The process was initiated by listing and preliminary grouping participants followed by reduction and elimination. The next phase was clustering and thematizing monitored by the concluding identification of invariant constituents. The fifth phase consisted of

Table 1
Demographics of Participants

Code	Age	Gender	User	Supervisor\Leader\ Manager	IT Duties
P01	27-67	F	x		
P02	27-67	M	x	x	
P03	27-67	F	x	x	
P04	27-67	M	x		x
P05	27-67	F	x	x	x
P06	27-67	M	x		

P07	27-67	F	x	x	x
P08	27-67	F	x		
P09	27-67	F	x		
P10	27-67	F	x		
P11	27-67	M	x	x	x
P12	27-67	F	x		
P13	27-67	F	x		
P14	27-67	F	x		x
P15	27-67	F	x		
P16	27-67	M	x	x	x
P17	27-67	F	x		x
P18	27-67	F	x		x
P19	27-67	F	x		
P20	27-67	F	x		

constructing individual descriptions that led to the sixth phase of the construction of a composite description.   The data of the present qualitative, phenomenological study was transcribed verbatim over a 30-day period and the transcribed data imported into NVivo 9.
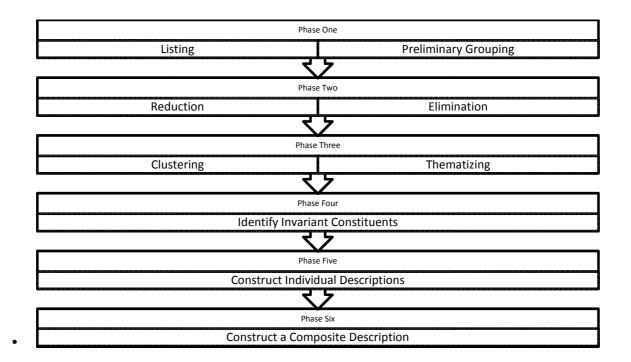
Phase One	
Listing	Preliminary Grouping

Phase Two	
Reduction	Elimination

Phase Three	
Clustering	Thematizing

Phase Four
Identify Invariant Constituents

Phase Five
Construct Individual Descriptions

Phase Six
Construct a Composite Description

Figure 1. **Data analysis process.**

Listing and Preliminary Grouping

NVivo 9 served as a helpful tool for listing and preliminary grouping by using auto coding for structured questions. Although auto coding does not analyze the data, the feature did permit the investigator to view the responses of all the participants in an orderly manner by listing and grouping the data. The use of horizonalization allows a investigator to create a list of relevant expressions produced from the data (Moustakas, 1994). Early grouping obtained from the interviews revealed three categories that consisted of the computer user, availability of data, and management interactions. The early inductive steps in narrowing data consist of coding interviews provided by participants, searching for key expressions, and creating lists.

Reducing and Eliminating

The first of two tests determined how the expression has the necessary component and subcomponent for understanding the expression. Abstracting and labeling the expression

consisted of the second test. The ability to abstract and label expressions meets the requirement for step two.

Expressions that failed to form meaning were eliminated from the study. Six expressions met the requirements for the second phase. The first two expressions related to technostress and how technology affects the work environment by leaders communicating with computers users and trust in managing daily activities. Two expressions about guidance emerged that focused on organizational culture and dependency on technology. The last two expressions observed a workforce culture of both submission and dominance.

Clustering and Thematizing

The combination of six expressions and six constituents formed into themes using NVivo 9 to perform queries and coding of the interview transcripts. The six themes developed the emergence of six constituents that described the lived experience of technology in the work environment. Furthermore, individual descriptions derived from the six constituents.

Theme 1: Leadership and communication in the workplace. Concerning servant leadership, 15 of 20 participants reflected positively on leadership; whereas, five of 20 participants reflected negatively about leadership putting the needs of end users first. Concerning transformational leadership, 16 of 20 participants reflected positively; whereas, four participants reflected negatively. The overwhelming message from participants is that organizational leaders do communicate effectively and attempt to ensure that all employees have the best IT systems to perform job tasks.

Theme 2: Trusting computer users to manage simple updates. Twelve of 20 computer users possessed no administrative rights and could not download basic software such as Adobe Flash and Java that permitted the participant to view and interact with web pages. No sense of empowerment was evident from the interviews from 12 of the 20 participants who possessed no administrative rights.

Theme 3: Organizational culture and the work experience. The organizations work in more similar ways than dissimilar ways by encouraging growth. However, the participant's statement revealed cultural differences in the manner of how support was made available. Participants stated that the organization received formal training for learning new software to improve the work environment better.

Theme 4: Dependency on technology. Dependency on technology is one area in which all participants agreed. Participants shared concerns that the failure of hardware and software technologies would create a catastrophic work stoppage.

Theme 5: Submission to policies concerning technology in the workplace.
Procedures consist of processes designed to give an organizational structure to achieve services or products. Participants shared lived experiences on following organizational policies in relation to attaining and using hardware and software. The main concern for participants was not getting instant assistance to rectify problems because of policies that block direct interactions with the IT departments.

Theme 6: Dominance created by the purpose of technology design. All of the participants discussed the manner of how technology is designed to keep employees from downloading and installing programs. Participants agreed with the need for organizations to control access to the network infrastructure. Participants were also frustrated with the lack of power to do anything about the situation when problems arose.

Table 2
Expressions, Themes, and Invariant Constituent

Expressions	Themes	Invariant Constituent
"Leaders ensured that we have the proper software" (P03), "leaders understand our needs" (P02), and "leaders know that we are up to par" (P06).	Leadership and communication in workplace.	Leadership and communication is very important.
"upgrade was blocked" (P01) and "computers' upgrades are managed only by our IT department" (P19)	Trusting computer users to manage simple updates.	No trust or very little trust exists.
"We have a good time-management system that we use to organize our work" (P07) to the opposite "not dealing with it very well" (P18).	Organizational culture and the work experience.	Getting the organization to support end users is possible.
"Bring my job to a standstill" (P01), "not be able to communicate" (P03), and "rely on my computer for all of my work" (P07).	Dependency on technology.	Independency from technology is impossible
"Computer upgrades should (be) managed behind the scene by IT members" (P03), "Well, normally any updates or upgrades are done between two o'clock and five o'clock in the morning when it's really slow so that it does not affect the business" (P05), and "IT is in charge of all updates" (P19).	Submission to policies concerning technology in the workplace	Submission to policy is unavoidable.
"We used to be able to make basic changes to software" (P01), "if everybody had the ability to do IT stuff, they will probably screw up the network and things get even worse" (P11), "on our system, we're not even allowed to upgrade anything" (P12).	Dominance created by the purpose of technology design.	External forces cause organizations to protect data by streamlining access to control data.

Identifying Invariant Constituents

Table 2 displays the emblematic expressions that made the six themes and produced six invariant constituents or components remaining unchanged. Recognizing the unchanging or invariant data relied on using NVivo 9 software to form queries and nodes. The purpose of identifying the invariant constituents was to gather information necessary to construct individual descriptions to reach the goal of achieving a composite description.

Construct Composite Description

The goal of the research was a composite description of the phenomenon on the effects of technostress and technology systems on end users satisfaction. Individual descriptions provided an insight into the composite description. The intent of the paragraphs below is to detail the path to a composite description developed during the research.

The 20 participants (100%) all recognized the importance of hardware and software technology (HST) in the workplace and stressed that it affected each of them. The impressions of computer users are adjectives control, permissions, and needs. More impressions included downloading, responsibility, teamwork, and support. Two potentially positive impressions were acceptance and reliance of the need for technology. All participants shared the idea that technology is necessary for an organization to remain effective.

The positive response on leadership was 75% (servant leadership) and 80% (transformational leadership) of the participants responded positively for leadership involvement in support for HST implementations. All participants spoke favorable of the dealing with complexity issues concerning learning new technology. Eighty-five percent of the participants spoke positively of dealing with insecurities when facing new technologies. Twenty percent spoke positively of taking work home. Forty percent spoke positively about being overloaded with work.

Participants were split evenly on the uncertainty of dealing with technology failure because of minor and major upgrades to the network. Only 35% spoke positively on budgeting issues when improving technology issues. Forty percent had positive views concerning power to control technologies that affect them.

Eighty percent spoke positively on dealing with envy for attaining the latest computer devices. Eighty percent spoke positively when speaking of verifying that systems are operational for work after upgrades. Eighty percent spoke positively about having patience when receiving services from the IT department. Seventy-five percent spoke positively about the procedures for requesting services.

Technostress

As mentioned in Chapter 1, technology systems allowed end users to multitask globally and assume more job tasks than any previous generation of workers (Tarafdar et al., 2010). Network outages, outdated technology devices, and misconfigured computers result in work overload (Tarafdar et al., 2010). Work overload (techno-overload) and stoppage because of technology spurned a new term from work related stress named technostress (Tarafdar et al., 2010).

Technostress results from information overload that causes the inability of end users to handle computer operability and technology interruptions from faulty systems (Ragu-Nathan et al., 2008). Learning new technology also contributes to technostress (Ragu-Nathan et al., 2008). Technology plays a part in producing overworked employees resulting in high stress that causes collateral influences on society affecting work relationships, personal relationships, and health implications (Tarafdar et al., 2010). Technostress consists of work related stress that focuses on stress endured by people who work with hardware and software technology (HST); a new and understudied field for research (Tarafdar et al., 2010).

Limitations of the Study

The limitations of the study consisted of interpreting the results, a small sample size, investigator bias, and use of interviews. Creswell (2007) stated the four limitations consist of typical characteristics in the use of qualitative procedures for scholarly analysis. During the planning phase of the research, modifying procedures addressing the limitations were part of the design.

The choice of the study population was an approach to address the first limitation of generalizability. Selecting various types of end users, organizational leaders, and experts who support the HST systems environment was a deliberate decision to ensure different viewpoints from which to investigate technostress. Choosing Cheyenne, Wyoming, as the focus for the study limited the results not transferable to a larger audience. However, pilot study testing of participants not working in the area of the Cheyenne, Wyoming, did not differ from the results provided by the target area.

The next process consisted of addressing transferability and generalizability with the purpose that created a defined description. Moustakas (1994) stated that an overarching strategy of research consists of creating a phenomenological composite description using the modified Van Kaam method. This occurred during the data analysis procedures by generating lists, reducing the irrelevant data, discovering themes and invariant constituents, and constructing individual descriptions.

To address the second limitation of a small sample size, the plan was to add more participants beyond 20 if there was no evidence of saturation or a repetition of experiences. The NVivo 9 software analysis provided the capability to proceed with the initial coding, categories, and themes until reaching the point of saturation or repeating themes and patterns (QSR

International, 2011). Further, comparison of the pilot study results and the study results provided evidence of saturation with the resulting six themes of the study appearing in both sets of data.

The third limitation arose from the decision to select telephone interviews as the primary data collection. The alternative was face-to-face interviews, but the logistical concerns of time and expense made the telephone a more viable choice. In addition to tape recording interviews, participants unwilling or cautious of recordings had the option to complete the interview and have the transcribing done instantly. The participants were interviewed after the participants were recorded and the forming of themes initiated. The comparisons of these interviews that asked the same questions took more time to document and read back the answer to ensure the documentation was accurate.

Mitigating tactics included advertising in the local newspaper, sending electronic mail of the composite description for comment, and recommended edits. Using multiple contact points provided different ways for participants to share. Another tactic was to ask telephone interview participants to provide any additional information that would benefit the study. Moustakas (1994) noted that practitioners should practice Epoche to produce a non-judgmental and unbiased report mitigated by the fourth limitation. Awareness and mitigation tactics reduced the normal influence of the four study limitations using the strict adherence to Moustakas procedures for phenomenological analysis.

Conclusions

End users face the daunting challenge of keeping pace with technology's rapidly changing the work environment. The pressure for end users to stay current with new technology remains an individual responsibility. However, an organization can choose how to provide guidance to assist employees on increasing knowledge of HST systems.

The study's limitations affected interpreting the results. Getting participants to reveal information they deem sensitive or at unease of disclosing information was a challenge. Ensuring that total confidentiality was assured gave some participants the confidence to proceed with the interview. However, a few potential candidates who seemed interested at first never followed through to participate in the interview.

Identifying new areas of technostress reflects on the growing dynamics of the work environment of end users working to complete tasks. This discussion illustrated the dynamic of connecting end users, organizational leaders, and HST systems developers to create devices and software to increase the efficiency for end users to manage technostress better. For example, for a small business with approximately 20 end users Microsoft and Dell offer to monitor every aspect of the organization with monetary and HST system upgrades that mimic the way an organization would purchase new systems. The goal of this exercise would be to see how new systems such as a new operating system (OS) or new tablet integrate with existing HST systems. The insight would provide all participants in the exercise to benefit the work environment and increase the understanding of technostress.

Recommendations

The participants for the present study may not be representative of the entire end user and organizational leadership environment. However, the participants did meet the description of an end user necessary to participate in the current study. A future study that consists of a more diverse population of end users could provide a wider viewpoint of technostress in the work environment. Studies that evaluate the types of technostress that exist and seek to discover new technostress' that affect the work environment could produce valuable information.

Recommendations for end users. Research focused on HST systems that enable end users to manage the ever-increasing abundance of tasks flawlessly directly relates to technostress. Technostress is a new study of stress in the field of study that needs researchers to find new information. End users can create social forums to have their voices heard so that their organizational leaders, creators of technology, and IT departments can gain a deeper understanding of the end users experience.

Recommendations for leadership. The focus of the study was understanding how technostress and technology systems affected end users satisfaction. The aim of the study was to provide the opportunity for end users at various levels in organizations to share information with organizational leaders globally about how technology affects end user satisfaction and develop strategies to mitigate technostress. Organizational leaders should take a proactive role in discussing IT related topics to see if the requirements to work at maximum capacity in relation to technology exist. This requires the organizational leaders to go beyond casual conversation and engage each end user either one-on-one or through group meetings.

Recommendations for future studies.   Studies conducted by future researchers analyzing this study could expand on areas of technostress not yet discovered or mentioned in the present qualitative, phenomenological study. The charts and tables in the current study provide future researchers with tools to research further how technology affects end users to mitigate technostress from the work environment. Whereas a national study would help citizens of the United States, a global initiative would help civilization from any county that incorporates technology in the workplace.

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