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Does Technostress Impact On University Students' Academic Performance in the New Normal?

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ABSTRACT

Technostress is a critical disease in the current competitive environment experienced by all of us with the rapid enhancement in technology. COVID-19 pandemic has changed people's lives to blend more with technology. Earlier, organizations and employees used more technology compared to school & university students. But now students have to use technology to do their studies, maintain their association with friends and to spend their leisure time as well. Moreover, every private and public educational institute is converting into online learning and teaching. Specially, all government universities are conducting lectures and assessments using technology. Even though this technology enables us to continue all our daily routines, it has a dark side that we need to examine. The purpose of this paper is to discuss about the technostress and its impact on academic performance among university students in Sri Lanka. Technostress is defined as a common problem of adaptation that may occur if the user is unable to adapt to, or work effectively with information and communication technology. This is vastly visible in government universities because there are many students who have stepped into the university representing both rural and urban areas in Sri Lanka. Technostress consists of several dimensions, including Techno-overload, Techno-invasion, Techno-complexity, Techno-insecurity, and Techno-uncertainty. There is a lack of empirical studies from the Sri Lankan context in relation to technostress and academic performance hence it is vital to examine the prevalence of technostress among undergraduates and postgraduates in Sri Lankan universities. This study therefore aims to provide researchers and practitioners a meaningful understanding of the university students' technostress and its influence on academic performance in the new normal.

Keywords-- Academic Performance, Technostress, Techno-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity, Techno-Uncertainty

I. INTRODUCTION

1.1 Background of the Study

The major transition from an industrialized society to an information driven society changed many aspects of human lives with digitalization. As a result, the increased use of information and communication technology has had a significant impact on modern education (Higgins, Xiao & Katsipataki, 2012; Henderson, Finger, Selwyn & Aston, 2015). Universities worldwide have been advancing their teaching methods and tools in compliance with well-developed information and communication technologies, such as promoting online learning, blended learning, and flip classroom (Wang & Li, 2019).

Based on Asian Development Bank (ADB) brief, Sri Lanka also made a remarkable, quick shift to online education after all educational institutions were forced to close in March 2020 due to the COVID-19 pandemic. According to online surveys of university administration, faculties, and students in June 2020, nearly all faculties in Sri Lanka tried online education, and close to 90% of students participated in online education even with a lack of experience and training. (Hayashi et al., 2020). The use of information and communication technology in learning has risen exponentially in academia, due to government incentives and encouragement. (Dunn & Kennedy, 2019). Today such integration of digital technologies can already be witnessed in Sri Lankan universities (Gunawardana, 2017). The use of information and communication technology is no longer optional for students as well as academicians. Currently, all most every state university use LEARN Zoom platform and learning management systems (LMS) to deliver online lectures, share lecture materials, submission of assignments and acquisition of documents, as well as to conduct online open book examinations.

The concept of technostress was initially introduced to the literature by (Brod, 1984) and this concept was defined as a modern adaptation disorder resulting from the inability to use current computer technologies effectively. Similarly, by updating this definition, Berger et al., (2016) defined technostress as the feeling of individual stress caused by the use of technology. The widespread use of technology in universities has led to the emergence of this harmful diseases to its users. (Jena, 2015 ; Upadhyaya & Vrinda, 2021). Technostress is a common problem of adaptation that may occur if the user is unable to adapt to, or work effectively with information and communication

technology (Ragu-Nathan et al., 2008). Additionally, Chiappetta (2017) stated, technostress is the negative impact on attitudes, thoughts, behaviors or psychology caused directly or indirectly by technology.

Technostress have been extensively studied in the literature on the organizational perspective specially its impact on job outcomes (Suh & Lee, 2017; Pullins et al., 2020). Furthermore, studies in technostress have focused on various groups like library users (Sami & Pangannaiah, 2006) teachers or academia (Ozgur, 2020; Jena, 2015; Joo et al., 2016), university students (Upadhyaya & Vrinda, 2021 ; Wang et al., 2020) employees in ICT (Fuglseth & Sorebo, 2014) and white collar workers (Pflugner et al., 2020). Past studies on technostress among students emphasized a variety of negative consequences, for instance, decrease in academic performance, productivity, dropouts, and deviation from academic work. (Upadhyaya & Vrinda, 2021; Jena, 2015; Wang et al., 2020).

According to Ortega-Maldonado and Salanova (2018) academic performance is one of the most relevant outcomes in the university setting. In university context, academic performance is the educational goal to be achieved by a student, teacher or institution over a certain period and is measured either by examinations or continuous assessments (Narad & Abdullah 2016). Past researchers identified various factors affecting academic performance, for instance, gender, marital status, learning skills, home environment and academic stress (Norsida, Adam et al., 2010; Shahzadi & Ahmad, 2010; Praveeni & Herath, 2020). In addition, existence of technostress also negatively impacts on the academic performance (Upadhyaya & Vrinda, 2021). Instead, existence of technostress in Sri Lanka is proven with findings of several researchers. According to Nafrees et al., (2020) university students stated they are consistently occupied and remaining task after each presentation is lot with current online framework. Besides, students encountered several challenges related to remote learning, for instance, poor internet connection, no access to devise, difficulty in online assessments and/or exams and maintaining faculty–student interaction that might lead to build technostress. (Hayashi et al., 2020)

This paper attempts to provide researchers and practitioners a meaningful understanding on the Sri Lankan university student's' technostress and its influence on their academic performance.

II. RESEARCH QUESTIONS AND OBJECTIVES

This research paper developed following research questions and the objective of this paper is to find answers to below research questions.

1. Does technostress available among state university students?
2. What is the relationship between dimensions of technostress (techno-overload, techno-invasion, techno-complexity, techno-insecurity, techno-uncertainty) and academic performance?
3. What extent does the technostress impact on the academic performance of university students?

In this paper, the researcher aims to identify the availability of technostress among state university students in Sri Lanka and the relationship between dimensions of technostress such as techno-overload, techno-invasion, techno-complexity, techno-insecurity, techno-uncertainty with student's academic performance. In addition, researcher aims to investigate the outcomes of technostress among university students and build a discussion on ways in managing the technostress in new normal.

III. METHOD

This research paper attempts to contribute to the existing knowledge in the scope of technostress and academic performance in Sri Lankan state universities by answering research questions developed above. Researcher referred articles in Emerald, Google Scholar, ScienceDirect, SAGE publications and other relevant University Grants Commission (UGC) reports in order to collect information with regard to academic performance of state universities, recent changes made on virtual learning considering COVID-19 pandemic and psychological concerns of students such as technostress and its dimensions. In order to answer them, a comprehensive literature review was done by using desk research strategy. Researcher tried to create a bridge between technostress and the academic performance in the situation where lack of research has been discussed about the impact of technostress on academic performance under new normal.

IV. LITERATURE REVIEW

4.1 Technostress and University Students

Today, university students have unprecedented access to digital media and technologies, having grown up as 'digital natives.' Digital devices and activities, and how people engage with them, are constantly evolving (Bohnert & Gracia, 2021). According to the "Getting to Know Gen Z" study conducted by Barnes & Noble College (2015), digital natives have more ability to discover, self-educate and process large amounts of information quickly. This leads to incoming students being smarter than ever before, thus making present conditions the perfect time for the

education industry to embrace and implement the next level of technology in universities.

While some researchers accept that digital natives have great facility with technology in general, others argue that they exhibit some challenges with key academic tools and applications that are widely used in the academic setting. For instance, Anderson and Jiang (2018) and Twenge (2017) offer that, despite greater use and familiarity with technology, digital natives often lack strong learning on technology and information management skills due to its rapid fluctuations. This can be identified as technostress which has been defined by Chiappetta (2017) as the negative impact on attitudes, thoughts, behaviors or psychology caused directly or indirectly by technology.

Technostress is a relatively new and understudied topic as compared with a vast number of studies examining benefits and potentials related to technology for organizations and individuals' personal and professional lives (Tarafdar, D'Arcy, Turel, & Gupta, 2015). However, most studies on technostress are in the government and industry sectors, with only a small number of them in the field of education (Al-Fudail & Mellar, 2008; Jena, 2015; Upadhyaya & Vrinda, 2021). Fewer still are based on higher education. In addition, the main focus of these studies have been on employees and teachers, whilst the student population is given less attention to (Jung, Kudo, & Choi, 2012).

In addition, technostress is not only related to technological aspects, but also to changing requirements in many learning pathways (e.g., design and delivery of content and instruction, learning process, and assessment) resulting from the use of technology (Jena, 2015; Jung et al., 2012)

Wang, Shu, and Tu (2008) summarized that technostress was 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" (p. 3004).

4.2 Dimensions of Technostress

Five dimensions were highlighted by Tarafdar, Tu, Ragu-Nathan, and Ragu-Nathan (2007) that link with the use of technology and are categorized as stressors associated with the use of technology. These stressors are techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty.

4.2.1 Techno-Overload

Role overload occurs when the requirements from an individual's role exceed his or her capacity in terms of the level of difficulty or the amount of work (Tarafdar et al, 2007). In addition, Tarafdar et al (2007) state that all accompanying tasks, such as loading or changing software, organizing files, tweaking formats, or experimenting with new features, add to the workload which do not address one's direct work requirements, which in turn creates role stress by increasing role overload.

Techno-overload is similar to role overload in that both imply the presence of changed or increased demands on the individual as a result of the stress creating condition (Ragu-Nathan, Tarafdar, & Ragu-Nathan, 2008). In this era, mobile computing devices, together with social networking and collaborative applications, make it possible to process synchronized streams of real time information which result in information overload, interruptions, and multitasking among people (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011). Techno-overload describes situations where use of information systems force university students to work more and work faster than ever before (Upadhyaya & Vrinda, 2021). In addition, Upadhyaya and Vrinda (2021) state that older students in universities experience significantly higher levels of techno-overload. Under the current new-normal atmosphere, there is a wide-ranging use of technology to conduct lectures, examinations, presentations, workshops and student meetings in Sri Lankan universities which might create techno-overload among students.

4.2.2 Techno-Invasion

Techno-invasion can be described as "constant connectivity" where individuals can be reached at anyplace without boundaries of space and time, facilitated by the invasive effect of the technology (Tarafdar et al., 2011). Upadhyaya and Vrinda (2021) relate it to universities and depict techno-invasion as the effect of technology penetrating students' personal lives and forcing them to work beyond normal college hours.

According to Yun, Kettinger and Lee (2012) the extensive use of mobile technology infiltrates the lives of individuals and causes conflict between work and life. In a university context, students can be contacted anytime, anywhere and with current persistent connectivity feature, students can never feel "free" of the technology, but always "on call" with their peers and teachers (Tarafdar et al., 2007).

The literature on techno-invasion in the field of education, and university education in particular is relatively limited. It's even more scarce in the Sri Lankan context. Rather, Upadhyaya and Vrinda (2021) found techno-invasion to be the highest contributor of technostress among students and further state that this may be due to the progress of technology ubiquitous which has led to the invasion of personal time.

4.2.3 Techno-Complexity

Techno-complexity is the unpleasant feeling that the new technology is complex and require tremendous effort to understand (Tarafdar et al., 2007). In addition, techno-complexity pertains to situations where an

individual perceives technology as too complex to use and that their skills are inadequate and thus feels the need to spend more time learning about different aspects of technology. (Tarafdar et al., 2007).

According to the findings of Ahmed and Amin (2012) technology has made individual tasks more complex whilst consuming more time, not only in relation to understanding and using the technology, but also to upgrade technological skills. This is because constant fluctuation and upgrades in technology usually require newer and higher levels of skills and knowledge (Rosen & Weil, 2000).

Upadhyaya and Vrinda (2021) state there is a significantly higher technostress among university students and this stress was higher due to techno-complexity. Hence analyzing more on techno-complexity from Sri Lankan context is vital.

4.2.4 Techno-Insecurity

Techno-insecurity refers to situations in which people are concerned about losing their jobs to new learning and teaching technology, techniques, or other persons with more technological capabilities (Jena, 2015).

Scholars have identified that many people believe that if they do not keep up with the latest technology, they will be replaced by someone who is more competent in using technology (Jena, 2015; Daniel, 2019). This causes performance anxiety and a true sense of insecurity, placing workers under even more strain (Daniel, 2019).

According to Christian, Purwanto and Wibowo (2020) due to the COVID-19 pandemic, academic lecturers experience job insecurity created by techno-insecurity based on the rapid increase in online learning websites, tutorials and information on the World Wide Web which substitute educators in the classroom. Moreover, this could have a positive or negative effect on their confidence in using computers to educate, anxiety in using computers to teach, and expertise in operating teaching applications. Thus, this creates a need to analyze how the changing attitudes of trainers have an impact on students' academic performances.

4.2.5 Techno-Uncertainty

Tarafdar et al. (2007) defines techno-uncertainty as perceived instability, due to the evolving nature of the work, and associated processes as well as constant introduction of new technologies. Therefore, it induces users to constantly educate themselves about the latest Information Technological features due to continuous changes, leading to users remaining mentally unsettled and uncertain.

Techno-uncertainty is a stressor for users because rapid change in technology do not give people time to grasp mastery of it and their skill or knowledge is rendered obsolete within a short period of time (Tarafdar et al., 2007; Jena, 2015).

For example, a university may implement a new Learning Management System (LMS) and require students to frequently adapt to new learning policies. This might lead to a moment where regular adjustment to the system prevents individuals from constructing essential knowledge. According to Upadhyaya and Vrinda (2021), female students experience higher technostress in techno-uncertainty compared to male students. Hence, the literature on techno-uncertainty in the field of education is limited creating a need for conducting more research on techno-uncertainty among university students.

After examining the available research in the field of technostress, a research gap is particularly noteworthy in this field. Though past studies have described 'technostress creators' through five dimensions which include techno-overload, techno-invasion, techno-complexity, techno-insecurity and techno-uncertainty, the individual impact of each dimension of technostress on academic performance has not yet received enough attention.

4.3 Academic Performance

At higher educational institutions, students should be able to apply self-directed learning successfully. Hence, they are assumed to be intrinsically and academically motivated as they are independent and able to adapt and adjust to their learning environment and its demands. This ensures positive and successful academic performance in their course of studies (Huna, Loy & Hansaram, 2013).

Regardless of the assumption that university students should and ought to be independent and self-directed in their learning, most institutions of higher learning do not take into account student differences and needs (Huna, Loy & Hansaram, 2013). As a common practice, examinations, academic assessments, discussion forums remain as an important component in measuring learners' performance and progress in their course of study.

Many researchers stated that digital literacy has affected student academic performance to a high extent (Ukwoma, Iwundu & Iwundu, 2016; Blummer & Kenton, 2015). According to Sriyalatha (2016) there is a significant relationship between academic performance and level of ICT knowledge of students in University of Sri Jayawardhanapura, Sri Lanka. It shows the students with higher level of ICT knowledge will perform better than those who have lower level of ICT knowledge. In the dark side of ICT, Underwood (2009) emphasized these technologies are not easily accessible by students and teachers and extent to which these facilities are accessible to students affects the educational experience that can be provided. Studies show students who lack skills in ICT may experience anxiety, stress and confusion while searching for information resources on the web (Blummer & Kenton, 2015).

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The subject of stress, stressors, coping strategies and academic performance amongst university students has attracted attention in many countries, especially in Asia, Europe and Australia (Akgun & Ciarrochi, 2003; Samaha & Hawi, 2016; Pascoe, Hetrick & Parker, 2019). As an Asian country, Sri Lanka plays a vital role in measuring the academic performance of university students during this transitional period from traditional classroom teaching into online self-directed learning. This study will support all universities in Sri Lanka to look again at their online courses, curriculum, assessments and the student body they are catering to, in order to provide meaningful learning experiences for them.

As per the above literature findings, the conceptual framework has been derived.

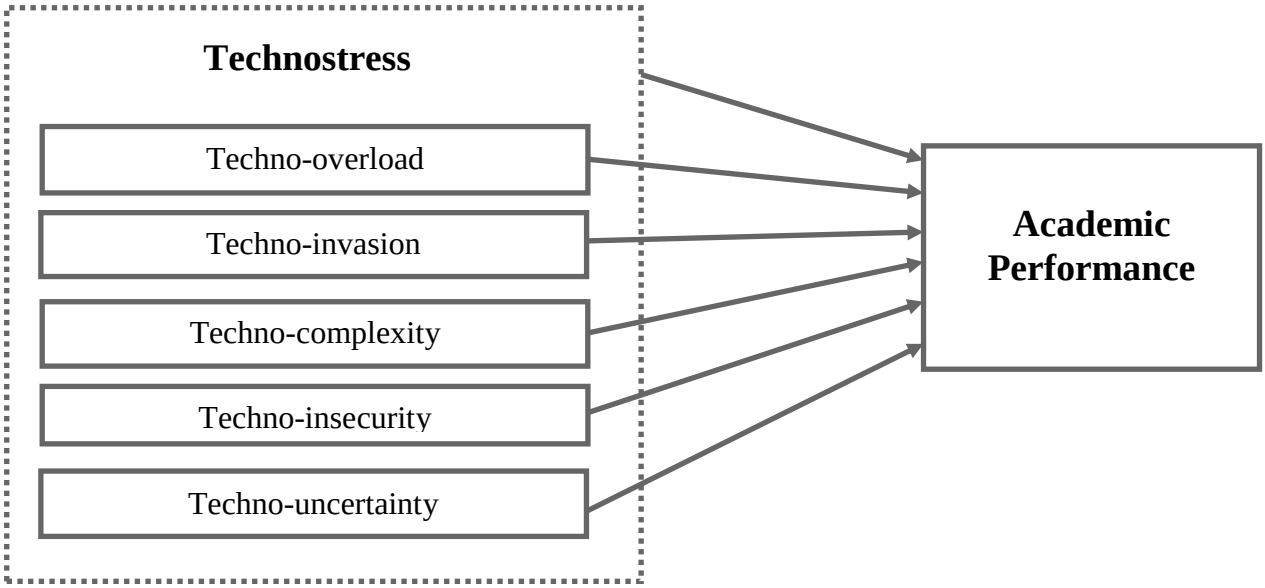

Figure 1: Conceptual framework

V. DISCUSSION AND CONCLUSION

In this new normal, students at all higher educational institutions, should be able to apply self-directed learning successfully. They are assumed to be intrinsically and academically motivated as they are independent and able to adapt and adjust to their learning environment and its demands. In general, most of the Sri Lankan state universities use examinations, academic assessments, discussion forums as the components of measuring learners' performance and progress in their course of study. But, regardless of the assumption that university students should and ought to be independent and self-directed in their learning, most institutions of higher learning do not take into account student differences and needs in studies.

- *Many researchers stated that digital literacy has affected student academic performance to a high extent* **(Ukwoma, Iwundu & Iwundu, 2016; Blummer & Kenton, 2015)**.
- *Technology is not easily accessible by students and teachers and extent to which these facilities are accessible to students affects the educational experience that can be provided.* (**Underwood (2009)**
- *Students who lack skills in ICT may experience anxiety, stress and confusion while searching for information resources on the web.* **(Blummer & Kenton, 2015)**

Due to COVID-19 outbreak, Sri Lankan education system has completely shifted into virtual platforms. Hence both rural and urban students in state universities are currently experiencing a huge stress occurred due to lack of technological skills called *Technostress.* Brod, 1984 defined technostress as a modern adaptation disorder resulting from the inability to use current computer technologies effectively. This could be measured among university students using several dimensions.

Dimensions of technostress	
Techno-overload	Situations where students who use ICT are forced to work more and faster in a short period of time during their assignments and examinations.
Techno-invasion	Situations where students who use ICT feel an intrusion on their personal time and space due to constant connectivity as they can be reachable at anytime and anywhere.
Techno-complexity	Situations where the complexity of new ICT forces students to spend time and effort in learning new applications, functions, technological terms which can be intimidating and difficult to understand, subsequently feel stressed.
Techno-insecurity	Situations where ICT users feel threatened by others with better technological skills or the introduction of new technologies that could replace them.
Techno-uncertainty	Constant changes and upgrades of technologies including software and hardware which do not provide ICT users with a chance to develop a base of experience for a particular application or system.

Table 1: Dimensions of technostress

The existence of technostress among university students in Sri Lanka also proven with findings such as "*consistently occupied and remaining task after each presentation is lot with current online framework"* **(Nafrees et al., 2020)**, *"Most students still had concerns over affordability and stability of internet access and providing laptops and uninterrupted, affordable, high-speed internet access, particularly for students in poor households or remote areas, is crucial to ensuring equal access to tertiary education"* **(ADB Briefs, 2020)**. Since future researcher can pay more attention towards the strategies to overcome the technostress among state university students.

Apart from technostress aspect, many people believe online education or use of technology in education enabled continuous learning without spreading COVID-19, saved time and physical space in delivering course content, facilitated information sharing and on-demand learning, and provided flexibility in teaching delivery. Yet, they do not think the performance and development of university students in future is questionable under continuous online education. Particularly in higher education institutions, they do not only provide knowledge in classrooms rather they always create a platform for student to develop social interactions, teamwork, personality management and development, know about others, taking part in extracurricular activities. Hence, future researchers and practitioner need to pay more attention on the above aspect of online learning which solely depends on technology.

Since this research paper limits the scope for a literature and there are only scant number of evidence available up to date related to academic performance together with technostress in Sri Lanka, it is necessary to fill the knowledge gap on technostress and academic performance related to state university students under new normal situation in the country.

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