Technology and Stress: A Proposed Framework for Coping with Stress in Indonesian Higher Education

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Technology is ubiquitous and becoming necessary for everyday communications. Together with personal and professional use, its applicability is widespread in every field of life, including education. Increased use of technology has been identified as causing stress, particularly among the younger generation, due to overload and complexity, which bring anxiety. To combat stress, individual differences such as personality, social, cultural, emotional and psychological wellbeing is required for sustainable development in a healthy learning environment. A massive increase in Indonesian society is expected due to the government road map towards making the country's biggest south Asian digital economy until 2025. The current study, based on a literature review, proposed a framework for higher educational institutes for contesting rapid technological interventions in Indonesian education. The strategic perspective of the study is two-fold, addressing institutional and personal strategies and defining mechanisms through overall personal and environmental well-being.

Key words: *Techno-stress, Techno-complexity, Techno-uncertainty, Techno-complexity, Technology and health, Social and psychological wellbeing, Higher education.*

Introduction

In higher education, there is a substantial change in the current era, with more use of technology, which has been expanded to personal and professional use simultaneously. The challenges are vital to address the educational complexes a place of proactive learning and stress-free environment. The majority of current students are living a fast track life which was not experienced by previous generations. The fast pace brings decentralisation in their campus lives. Now students want a life that has the ease, best services, high quality and low

cost offered by technology. For instance, online educational materials, communication through the internet and generating social activities through social networks have invited users across the globe to take advantage of learning and knowing the world. Social media has no boundaries and is free for all to gain knowledge and challenge existing knowledge, therefore a free flow of ideas can be found there. Educators use these forums for facilitating learning, and forums like YouTube make podcasting easy for delivery of class lectures for learners across the globe. As in Korea, the expansion of higher education has been noted due to investments in private institutions (Chae and Hong 2009). The focus of private investments relies on business prosperity, so urbanisation provides owners with flourishing businesses. In Indonesia, higher education has reported a sharp increase during the last two decades and the private sector is contributing more to expansion (Welch 2007). This expansion brings pressure on government institutes to promote quality education in comparison to the quality provided in private institutes, since the quality of education has a unique and significant importance in the development of any society, as well as its intellectual or human capital (Raza, Noor & Fareed, 2020). Perhaps, therefore, the influence of the private sector pushes government institutes to improve and upgrade their education systems as well. The same is happening in Asia, particularly in Indonesia. Both private and public universities are heading towards excellence in education by focusing on research in education. The focus of higher education seems to shift towards promoting research culture for facilitative learning, which plays an important role in education (Russell 2004). The increasing role of technology becomes a need of time and for effective management, which is being used to provide an innovative approach in higher education (Huda et al. 2019).

Since Time magazine declared social media as person of the year in 2006, its dominance has become more visible everywhere around the globe (Selwyn 2012). Internet users, including higher education institutes and educators shape a greater role in social media due to its acceptability and wide range of usage. The Information communication technology (ICT) role has increased in many ways, like spreading information, being used as a source of ready information, exchanging ideas, etc. The ICT's role in the globalisation era is influencing flexible mind users in higher education (Adenusi, Adebayo, and Oni 2019). It is also affecting the quality of teaching and learning, which can cause a radical change in the higher educational system (Tømte et al. 2019, Dave 2019). The increased role of ICT in higher education produces many effects over productive student engagement, as well as quality educational institutes (Coates 2005, Alzafari and Ursin 2019). Positive attitudes towards excessive computer technology are a key element that helps in building social collegiality (Veiga, Rosa, and Amaral 2011). Individual self-efficacy and psychological wellbeing are required to be considered the first step before providing initiating training related to ICT users (Beas and Salanova 2006).

The ubiquitous role of technology is causing stress, and the psychological instability of the users in education (Tacy 2016). Smartphone applications, social media, and the internet are a few of the techno invasions that are reshaping campus life these days. The iniquitousness of technology may generate stress in multiple ways like complexities, overload, and uncertainty. To deal with such stress, users reflective learning sensitivity (psychological and social wellbeing) is a point of concern for strategic education environments and services (Lee, Jin & Choi,2016).

By the literature direction, it is assumed that psychological, social and cultural values have significant importance for quality work engagement and dealing with ICT related stress. The current study aims to hypothetically develop understanding about technostress, coping strategies and individual psychological and social wellbeing among university students in Indonesia.

The Protocol of Literature Review: Developing Concepts

The following table provides literature direction and insight about concept development i.e. sets of competing models (Torraco 2005). The extant literature review was conducted in two steps as suggested by (Webster and Watson 2002). Step one was executed by gathering relevant TS studies from Google scholar, using the keywords technostress, the role of technology, the role of the information system, ICT and education. The restriction of the literature was also considered. Tu, Wang, and Shu (2005) conducted the first of its kind of study in China which has discussed technostress creators.

Table 1: Earlier Studies about the role of Information Systems

No	Study	Related discussions	Citation(s)
1	(Weiss 1983)	Organisational stressors, job dissatisfaction, social support, personal differences	149
2	(Lazarus and Folkman 1984)	Stress process, coping with stress, stress management	59249
3	(Baroudi 1985)	Intentions to quit, satisfaction and commitment	391
4	(Sethi, Barrier, and King 1999)	Conflict and ambiguity roles, burnout, exhaustion and commitment	153
5	(Moore 2000)	Turnover, exhaustion, workload, and conflict in role	1050

The Table 1 studies summary explains the role of information systems discussed as stress, conflict, exhaustion and coping mechanisms in organisations. Weiss (1983), examined finding sources causing stress among organisational information systems users and discussed its negative effects on health. Lazarus and Folkman (1984), later discussed psychological

stress and coping pressure, which triggered scholarly attention. The study provided significant important insight into stress and health and the process of developing stress. Lazarus and Folkman also discussed the common reason(s) (personal and professional) for developing stress. One of them was being unhappy at the place of work. The reasons causing this unhappiness could be too great a workload, long hours of duration, etc. Baroudi (1985), explained and discussed computer dependence in organisations, which at that time was reported as a cause of intentions of quitting work. The development of this concept became broader with Sethi and Moor's work later on.

Table 2: Theoretical direction of the construct(s)

Study	Related discussions	Citation(s)
(Tu, Wang, and Shu 2005)	Tech-stress creator(s) and productivity	153
(Tarafdar et al. 2007)	Tech-stress creator(s), overload, conflict, and productivity	676
(Ragu-Nathan et al. 2008)	Tech-stress creator(s), performance, commitment, satisfaction	679
(Wang, Shu, and Tu 2008)	Tech-stress and innovation	220
(Tarafdar, Tu, and Ragu-Nathan 2010)	Tech-stress, innovation, facilitation, user satisfaction & performance	406
(Ayyagari, Grover, and Purvis 2011)	Tech-characteristics, exhaustion, overload, privacy issues	781
(Shu, Tu, and Wang 2011)	Tech-stress creator(s) tech-dependency, self-efficacy	236
(Riedl 2012)	Tech-stress and gender, education	154
(Lee et al. 2014)	Smartphone usage, social interactions, and anxiety, loss of control	581
(Tarafdar, Pullins, and Ragu-Nathan 2015)	Tech-stress, self-efficacy	144
(Srivastava, Chandra, and Shirish 2015)	Techno-stress and personality types	111
(Maier et al. 2015)	Tech-stress and social networks, usage intentions	216

After the publishing of the article by Tu et al (2005), the role of tech-stress came into scholarly consideration. The technology was assumed to facilitate organisations and their human resources, but the dark side was revealed because of overload and complexity causing low productivity and workplace conflicts. Tarafdar et al. (2007), developed the techno-stress multi-dimensional measurement scale, including tech-anxiety, complexity, uncertainty, and overload.

Theoretical Consideration

Educational institutes are facing many challenges in making policies. A few of these challenges are concerned with the quality of education, students' academic performance, psychological and social wellbeing, which portray a social image in society. Management processes, educational programs and standard practices in education are the focus from an institutional point of view, to fulfil the quality criteria (Darojat 2018). Technology is playing a key role in revolutionising and shaping the modern education system. Higher education campus lives in learning within and outside of the classroom have increased. Educational institutes in Indonesia follow a digital roadmap of 14th Economic Policy, with e-commerce aiming to be the biggest southeast Asian digital economy by the year 2020. In Indonesian higher education, competition in public universities is higher than in private institutes. Students with 43% of overall youth under 25 years of age pass tertiary education (*Asian Development Bank report, 2015*). The biggest disadvantages of technology in education are distractions which can be further divided into aspects such as the use of mobile phones, social networks and Instagram for personal and academic activities. According to Moor (2017), these forums are very popular and reveal widespread usability in Indonesia. Li and Peng (2019), identified the widespread use of such tools for personal and educational communication. The technological devices, particularly cellphones, remain unplugged and youth, in particular, are addicted to them (Parasuraman et al. 2017).

The ubiquitous internet access causes interruptions in many ways, including incoming messages, emails, electronic invitations, and replies, which are immediate attention capturers and result in loss of flow (Montag and Walla 2016), which may in turn result in reduced productivity due to multitasking. Tarafdar et al. (2007), termed it an overload of technology, as there are so many portable and similar devices available at the same time, including cell phones, laptops, desktops and tablets that can enhance human dependence on technology. The dependence further creates human interdependence with such devices also available for socialising, like Facebook, Instagram, and WhatsApp that may result in techno-complexity and Techno-uncertainty (Dorner 1996). Dorner explained the existence of interdependent variables of the same system causes subjective complexity and uncertainty. He explained that it is not required to understand the full system, but the factors creating ambiguity, time and situation in a subjective way are enough for understanding the phenomena. Complexity and uncertainty phenomena are challenging and on one to claim universal understanding. It can be called-element creating barriers to human cognition and psychology which can lead to mistrust in the key relationship (Bruneel, Spithoven, and Clarysse 2017). The human relation with computers or devices may be seen in this context and causes philosophical changes in objective reflections. Complexity and uncertainty are a twofold challenge for human cognition. It could cause behavioural complexity and required psychological skills (Boschetti et al. 2011). Dorner's view helps us understand that without any instructions, the human

mind, from its own thinking can find strategies for problem-solving in complexity and uncertainty. Based on the points mentioned above, we can hypothesise the following:

H₁: Technology stress is a combination of overload, complexity, and uncertainty.
H₂: Technology stress requires strategies to cope.

Higher education also plays a significant role in developing the soft global image of the country. Educational developments are linked with social developments and due to insufficient facilities in ruler areas, students migrate from small cities to larger cities, and from one country to another . Since Indonesian higher education independence as a separate Ministry MRTH (2015), the quality emphasis has been increased. Many central promotions of higher education have been seen since the year 2015, causing increased student mobility. Student mobility for indigenous and international students due to availing quality education has a link with many social and psychological concerns. For instance, it may cause social incompatibility with the local atmosphere in socio-cultural adoption within a country. Indonesia has 300 different ethnic groups and hundreds of local languages. Another factor is living away from families, which could result in some psychological issues, like different life experiences, changing emotions, and personal, psychological, social good beingness. Living away from the home town or country becomes challenging, which is linked to personal decision making, causing significant implications for life decisions. Leaving a native place for a longer time offers several advantages like greater and personal life satisfaction (Adam et al. 2018).

Teachers nowadays use more multimedia technology in learning, however, research about acceptability from learners' points of view suggests that its acceptability lies in the interest of learner and technology-to-performance chain and there is the positive effect of user's perception of fit in learning and multimedia technology (Park et al. 2019). Online engagement is acceptable in society, but a debate about its role is yet controversial. Many argue about the stressful effects of online engagement, which has become a global phenomenon, and irrespective of demographic and cultural differences, social participation is increasing. People now discuss politics and social issues more openly on social media due to individual participation online. Social capital has positive effects on social media evaluation in Australia and China (Wang and Liu 2019). There is much need for customised policy about the privacy of individuals to be protected according to local culture and social acceptability in online engagement. Cultural acceptability is important in online engagement and privacy risk and privacy control can moderate this relationship (Wang and Liu 2019). Vygotsky (1978), presented the sociocultural theory which explains two levels of development of culture in a person's learning, first, social and second, individual. The idea represents both social and cognitive development. The first is interactional base development which integrates with the mental level of an individual. The second is potential cognitive

development, where students are cognitively prepared yet social interactions help in complete development (Briner 1999). Keeping this in mind we can see that cultural and psychological (*cognitive-based*) development is an integral part of the development of a young mind. Both factors help in building and shaping personal learning. The role of Pancasila is an important phenomenon to realise in Indonesian culture, society and the psychology of its people. They call it spiritual, religious, cultural and modernity successfully fused on earth (Sofjan 2018). The role of religion and culture in modern society cannot be negated. Hence, we can assume that:

H₁: Social, cultural and psychological wellbeing is subject to modern age Indonesia.
H₂: Religion is an integral part of modern Indonesian society.

Students living in Indonesia become techno-centred due to its process of implementing the digital economy and e-governance and due to ease in usefulness (Putra 2016). The form of acceptance of technology is more obvious in youth, because they can communicate with friends over social networks so easily and their social network is enhanced by class fellows and other peers, and social media forums enable faster communications with fewer efforts. Therefore, there is increased research attention towards social site networks users to find the key changes and developments (Boyd and Ellison 2007). Web-based social interaction across the globe thus revealed that social relationships are one of several reasons for using social network sites. These platforms provide a chance to foster social relationships, which are becoming the most important factor for signing up to social sites for 31% of new people. Besides meeting new people, 21% of people use them to get in touch with old buddies on such networks easily (Brandtzæg and Heim 2009). Social network sites offer a wide range of activities, and these activities are categorised into passive and active usage by researchers (Burke and Kraut 2014, Deters and Mehl 2013, Verduyn et al. 2015). Extensive communication over the internet reported less interaction with society, declines in communication with family and reducing the size of the social circle, while increased depression and status of loneliness required redesigning of technology and strategies for public policies (Kraut et al. 1998). The social context of subjective well-being or happiness is linked with health and direct life satisfaction. Family and marriage, friends and community ties, religiousness and civic participation (individually and collectively) in the neighbourhood, were found in support of subjective well-being and physical health in Canada and the USA (Helliwell and Putnam 2004).

A wide range of socialising and use of technology in education is causing techno-stress Tarafdar (2007). Techno-stress and academic performance are linked (Salem 2018), because of increased technological interaction, and this stress is having a negative influence on the abilities of students, resulting in a decrease in academic performance. Technology stress may lead students to fail to complete daily academic tasks i.e. quizzes or assignments and became

lazy. Techno-stress overrides student activities and the ability to control the situation. Techno malfunctions increase frustration and techno complexities bring dissatisfaction and bring anger in students, which causes procrastination and avoidance. Socialising of ICT can bring more stress in the form of increasing workloads, bringing complexity and uncertainty.

Techno-stress requires coping strategies for individuals. Coping with stress occurs when there is a negative association with events, realities and human tolerance is challenged. The nature of the coping strategy can be different, because psychological stress is linked with negative challenges, causing change and required adjustments to adopt the change. Adjustment to change is a factor based on individual preference or choice. It also varies with the situation as well. When information is overloaded, it may lower the expectance of individuals from stress elements and bring avoidance or discountenance (Chen, Tran, and Nguyen 2019). Mahapatra and Pillai (2018), discussed a wide range of coping strategies in ICT techno-stress, including seeking support, turning to practice religion for emotional healing and restraining or problem-solving behaviour. According to the above-mentioned details, the following can be assumed:

H1: Avoidance, seeking support, problem-solving, and religious coping strategies are effective for coping with techno-stress.

H2: Indonesian students may face techno-stress

Hypothetical Proposed Model for Research

Figure 1. Hypothetical Framework
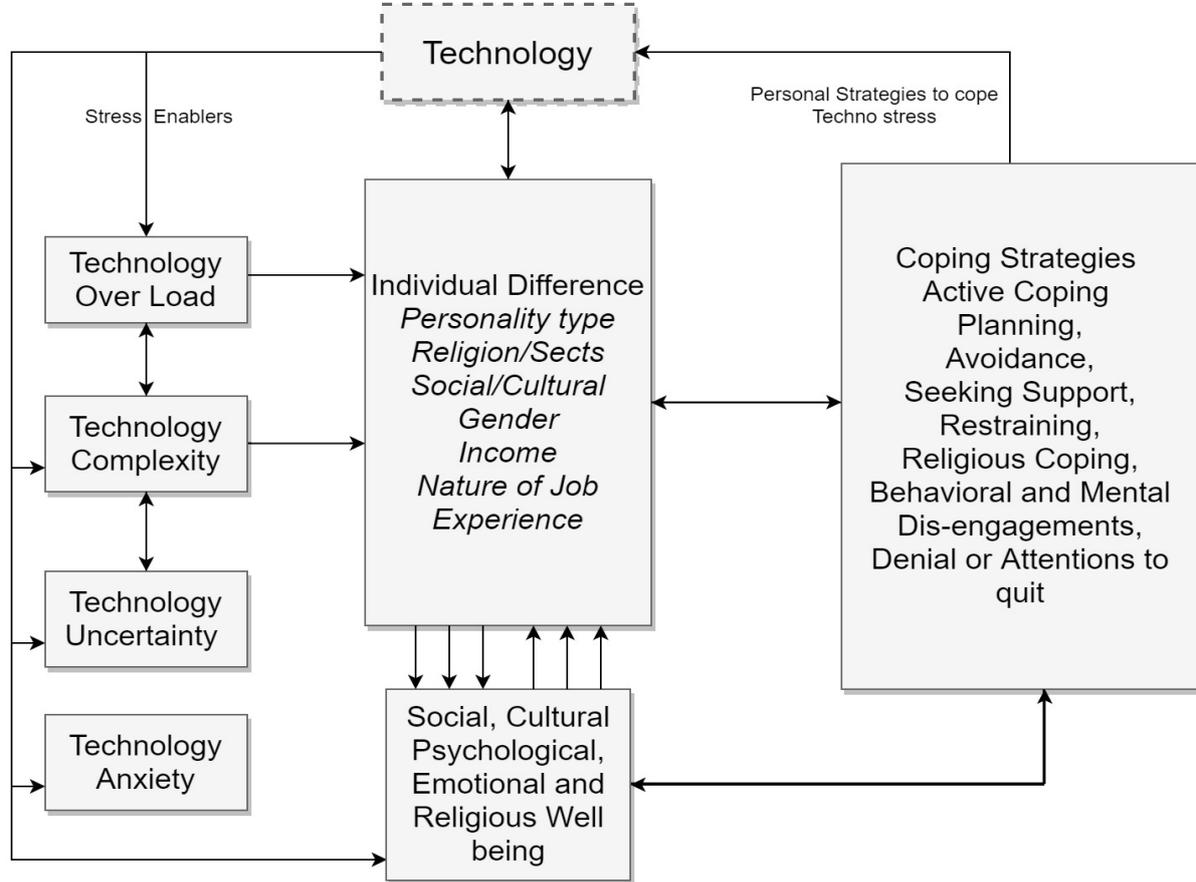
Conclusion

Marcoulides (1989), explained that personal good or bad experiences with devices like computers, laptops or smartphones can bring distrust towards communication channels. These experiences can create psychological effects like increasing insecurity towards technology, decreases in confidence or challenging comforts of overall use of technology. These insecurities produce stress (Hampton 2019) and further lead to stress for organisations and society (Richmond and Skitmore 2006). The widespread of internet multitasking among students for personal and academic use produces further loads (Reinecke et al. 2017). The organisations hence may realise the increasing overload may cause anxiety to end-users. The digitising process of the Indonesian government as an initiative towards achieving the biggest South Asian Digital Economy by the year 2025 hence will bring some definite technological expansions among Indonesian organisations. While the country is big and has lots of multicultural ethnicities yet Indonesian society. Diversity and inclusion can be addressed by social inclusion. Social representation keeping emotional and psychological attachments in

mind can be beneficial because Pancasila as a social inclusion phenomena has a notable religious, spiritual, cultural and social nature which can play a prominent role in Indonesian formal education (Rachmatullah et al. 2018). Strategic allegiance with Pancasila as a tool of social inclusion may help in building effective commitment with the organisations, particularly educational institutes. The technology acceptance in Indonesia is already increasing in higher education and universities stepping towards digitising may consider the strategic improvement of the educational system in Indonesia (Jamaluddin et al. 2019). However, it is worth mentioning that personal wellbeing and the user's feeling of connectedness through ICT can help social inclusion for older people, *which means less isolation* (Francis et al. 2019) and builds competencies to cope with the stress through training (Musil et al. 2019).

Giuseppe et al. (2019) intended to technostress the pervasive use of technology for communication and information from a personal viewpoint. Factors from personal and professional sources may arise and due to multiple functions of *Information and communication technology* pressure can be increased through overload and anxiety among users. Hence through this study we may propose two steps for the educational sector 1) to identify the techno-stress among students: *if it is existing or not*, 2) to map the dimensions by which way the pressure is increasing, so effective strategic management from the individual point of view can also be planned and executed.

Recommendations

Tech-stress affects individual productivity due to many and required strategies to cope (Tarafdar et al. 2007). The overload and conflict of technological aids which were assumed to facilitate humans are now causing burdens. Versatility and increased roles are building complexities in humans to deal with similar functions but are different in behavioural approach applications. The current study provides future directions and a research framework for multiple organisations in Indonesia, particularly in the educational sector, but not limited to higher education only. The suggested framework may be adopted to understand, explain and find the dimensions of technology-related stress among all of its users. The effectiveness of studies in the educational sector will prove beneficial for organisational strategies as well as individual for many reasons particularly: 1) to prepare healthy environmental campus activities 2) providing youth with a chance to record their opinions to identify technology stress enablers 3) to provide their input for existing levels of social, emotional, psychological and cultural wellbeing in youth 4) to make next-generation balanced processing into supply digital human resource industry.

Significance of the Study

The importance of the study can be seen in two ways 1) from individual perspectives 2) from organisational perspectives. Both are essential for mutual benefits as well as socio-cultural environmental issues. Behavioural issues create distress among humans and for youth this is inevitable, as this age group is vulnerable to stress issues compared to the older ones. Students at an early age often find understanding the meaning of life and purpose of life difficult, and if they feel distant with the meaning of life and purpose of life, it could lead towards suicidal attempts (Wang et al. 2007). Coping strategies based on the inner sense of thinking for a positive life can be beneficial in balanced persons and not every individual is capable of dealing with stress with positive psychology at an early stage of life. Optimal quality of life means to achieve the overall quality of life, yet a stress enabler can cause hurdles as technological rapid advancements are unavoidable (Zinam 1989). The path may come across various socio-cultural aspects i.e. social, cultural, emotional material, safety and security, and peace. Hence creating a balanced environment for psychological, social, cultural and emotional wellbeing is the only solution to the problem, yet it is beneficial for society as well. Educational institutes are known for transforming society and educating people slowly and gradually. Thus, the effects may provide beneficial for society in the long term. The social benefits come through individual wellbeing and individual wellbeing of society can come through educational environments. Hence the educational institutes may adopt the policies and strategies for long term benefits, not only for the sustainability of organisations but for society overall.

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