Technostress at the University: How does it affect job satisfaction?

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ARTICLE INFO	ABSTRACT
	Digitalization and performance efficiency are currently enforced in all fields, including in higher education. Universitas Negeri Padang as one of the universities in Indonesia also does not stop doing digital transformation and efficiency. In addition to the implementation of e-learning and hybrid lectures, UNP has just released the MyUNP application and the SIMTA application. This requires users to quickly adapt to this new application. On the other hand, lecturers and education personnel are also still trying to adapt to previously released applications such as sister, e-performance, rumah gadang, and so on. This study aims to see how the level of stress caused by technology or known as technostress on lecturers and education personnel then will also see how it affects job satisfaction. This study had 37 respondents and was analyzed using SPSS and SEM-PLS analysis tools. Conducted at the end of the year which is a deadline for various tasks and workloads, this time was chosen to be able to more accurately record the level of technostress felt by respondents. The results of this study show that three dimensions of technostress have a negative effect on job satisfaction but there are two dimensions of technostress that can have a positive effect on job satisfaction. Further discussion of the results and suggestions for future research are discussed.

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INTRODUCTION

Universities worldwide continue to enhance their agenda for education by increasingly promoting the use of information and communication technologies, such as initiating distance learning and hybrid learning (Qi, 2019). Admittedly, these efforts should be applauded as they have the potential to benefit learners. However, these efforts can also increase pressure on university teachers who are often less tech-savvy than students (Wang & Li, 2019). Likewise in Indonesia, to be precise at Padang State University, which is currently high has been transformed and managed digitally. Digitalization has been carried out starting from managing campus administration to educational activities.

Just like in the rest of the world, the digital transformation at UNP was most profound when COVID 19 hit. The COVID-19 pandemic eventually forced institutions to change teaching design, reorganize online learning strategies, and consider the possibility of a permanent *blended learning system* (Amalia et al., 2023). UNP provides *e-learning* as a special learning media. Every lecturer and student is forced to be able to use this technology. In addition, lecturers are also expected to be able to make learning videos uploaded to youtube, conduct *teleconferences* through zoom meetings or google meet, and other activities. Post-COVID, digital transformation is still intensively carried out at UNP. Like the

end of September 2024, UNP released the MyUNP application which has many features, one of which is as an employee performance recorder, through the presence of lecturers and education personnel in various campus agendas which can be recorded directly based on location and photos at the event location. This system is very effective in reducing all forms of fraud in attendance. In addition, this application has accuracy in time, location, and reliability in recording various activities that employees participate in so that employee incentive payments can be paid accurately and in accordance with the performance performed.

Besides all these advantages, technology users in this case are forced to understand and be able to use the applied technology because it is an obligation. The application of technology on the UNP campus also seems to be one of the supporters of organizational downsizing. At the beginning of 2024, UNP downsized the organization by eliminating department secretaries for all departments in UNP. In addition, Vice Dean III was eliminated. This makes the work that was previously the responsibility of the department secretary delegated to the head of the department and academic administrators in the department. Other jobs that are too heavy and cannot be completed by academic administrators will be delegated to lecturers with the support of team formation. Such as the formation of the study program e-performance admin team. As well as the SIMTA admin team (Final Project Management Information System). Lecturers must adapt to new technology on the sidelines of academic demands that must also be done.

Various additional tasks with new technology and mandatory lecturer workload tasks must be completed by lecturers in one semester. This is a driving factor in the creation of *technology overload* which is one of the dimensions of *technostress*. *Technostress* is stress arising from the use of this technology (Rahmawati, 2024). Furthermore, *Technostress* is the psychological strain and negative emotional responses that arise from the use of technology, especially in the work environment. This modern phenomenon is characterized by feelings of anxiety, tension, and distress as individuals struggle to adapt to new technological tools and processes. (Ragu-Nathan, et al., 2008). The term was first introduced by psychologist Craig Brod in 1984, who described it as a "modern adaptation disease" due to the inability to cope with the demands of computer technology in a healthy way. Some other dimensions that are part of *technostress* are *Techno-Invasion, Techno-Complexity, Techno-Uncertainty, and Techno-Insecurity* (Kumar, 2024).

The use of technology on the one hand provides benefits, but on the other hand it also poses challenges, especially for UNP lecturers and education personnel. A study conducted by Khlaif et al. (2023) identified that people with higher levels of education, such as academics, also experience technology stress. Especially at the end of the year, lecturers and education personnel have various deadlines to complete. Such as deadlines for filling out accreditation forms, deadlines for data input of e-performance data and IKU of study programs, deadlines for writing and reporting research and community service, deadlines for research assignments and student exams, guidance deadlines due to student graduation targets at the end of the semester. Therefore, now is the right time to assess how their condition and perception of the level of stress felt. This study aims to explore the level of *technostress* felt by lecturers and education staff at FEB UNP.

LITERATURE REVIEW

Technostress is an adaptation problem experienced by individuals when they are unable to overcome the challenges associated with using technology (Tarafdar et al., 2015). Kumar (2024) explains that *technostress* is formed from 5 dimensions, namely,

1. *Techno-Overload*, a feeling of being overwhelmed by technology-related information, tasks and demands.
2. *Techno-Invasion,* which is the feeling that technology intrudes on personal life and downtime, the loss of boundaries between work and personal life.
3. *Techno-Complexity,* which is the difficulty in learning and using new technology or complex systems.
4. *Techno-Insecurity* is the concern of losing jobs or skills due to technological developments, or feeling incompetent in using technology.
5. *Techno-Uncertainty* is uncertainty about future technological changes and their impact.

Similar to the concept of stress in general, *technostress* can also be classified into two categories, namely *techno-eustress* and techno-distress. This classification will depend on how the individual assesses a stressor. *Techno-eustress* is the positive stress experienced by individuals in the use of technology, because they feel that the technology can provide happiness for them". In contrast, *techno-distress* is "how individuals perceive technology as a threat that leads to negative stress that will be detrimental" (Tarafdar et al., 2019).

There are several factors that affect *technostress* according to Ayyagari (2011), namely (1) **Individual Factors:** Personality (e.g. *locus of control*, *self-efficacy*, *computer anxiety*), Demographics (age, gender, education), Experience and skills using technology (2) **Organizational Factors:** Organizational culture and work climate, ICT-related management policies and practices (e.g. flexible working hours, technical support), Job design and task demands related to technology, Technology-related leadership and communication styles, (3) **Technology Factors:** Technology characteristics (e.g. complexity, reliability, *user-friendliness*, availability), Intensity and frequency of technology use, Type of technology used (e.g. *email*, social media, *video conferencing*, information systems).

Research consistently shows that technostress has a negative effect on job satisfaction. For instance, a study indicated that technostress creators, such as excessive workload and constant connectivity demands, lead to decreased job satisfaction among employees (Al-Anshari & Al-Share, 2019). Jena (2015) highlighted that technostress correlates negatively with job performance and satisfaction, indicating that as technostress increases, job satisfaction tends to decrease. Furthermore, findings suggest that the stress from technology can lead to feelings of low motivation and dissatisfaction with one's work environment (Aktan & Toraman, 2022). Therefore, this study wants to further analyze how technostress affects job satisfaction. Thus, this study hypothesizes:
H1: Technostress has a significant negative effect on job satisfaction.

METHOD

This research is a quantitative study with a causative explanatory approach that aims to provide an explanation of the level of *technostress* experienced by lecturers and education staff at the Faculty of Economics and Business, Universitas Negeri Padang and how it affects their job satisfaction. This study uses primary data, namely data obtained directly from respondents through surveys. The research respondents consisted of 37 respondents. The sample selection technique used in this research is *non-probability sampling* technique: *Purposive sampling*. This technique is used because the phenomenon of this research is very specific and only occurs in FEB UNP. Such as the phenomenon that occurs when research respondents use the MyUNP application, SIMTA, sister, Rumah Gadang, e-performance, e-learning, working on accreditation forms, student and lecturer administration, academic portal management, academic information systems, websites and various applications and other technologies observed by researchers at this Faculty. This is in accordance with Sugiyono's explanation (2018) which states that *purposive sampling* is used when a study selects respondents according to certain criteria. The criteria set here are lecturers or education personnel who have main tasks and additional tasks using the application. The questionnaire was given to respondents via *Google form*. The data obtained is then used to analyze the level of technostress that occurs in respondents. The analytical tool used to analyze the data is SPSS. Then proceed with regression analysis of the effect of technostress on job satisfaction using the SEM-PLS analysis tool.

Measurement
This study used measurement items by Urukovicova, et al. (2023) which measured the level of *technostress* in college staff in Slovakia. This question item consists of 5 dimensions of *technostress* originally developed by Ragu-Nathan, et al. (2008) which consist of *technostress* dimensions are *Techno-Invasion, Techno-Complexity, Techno-Uncertainty*, and *Techno-Insecurity*. Ragu-Nathan et.al (2008) proposed 25 question items, but there were 2 invalid items. Finally, following the research of Urukovicova, et al. (2023) who used 23 items, this study also used 23 items that had been tested in Slovakia and in this study tested in Indonesia.

RESULT AND DISCUSSION

The respondents of this study were 37 lecturers and education staff at the Faculty of Economics and Business, Padang State University. A total of 24 respondents were female and 13 respondents were male. Respondents were mostly in the age range of 28-36 years. Lecturers who filled out the questionnaire were 29 people (78.4%) and the remaining 8 people (21.6%) were education personnel.

This study then analyzed the data of 37 respondents' answers to each dimension of *technostress*. In addition, it also conducts regression to see how each dimension affects the job satisfaction of lecturers and staff of FEB UNP. After analyzing the average answers of respondents using the SPSS 20.1 for each dimension, here is the average respondents' answers to each indicator of the *technostress* dimension:

Table 1. Average respondents' answers to each indicator of the *technostress* dimension

Indicator Number	*Techno-Overload*	*Techno-Invasion*	*Techno-Complexity*	*Techno-Insecurity*	*Techno-Uncertainty*	Job Satisfaction
1	3.1081	2.9189	2.3784	2.1351	3.7297	3.8333
2	2.9730	3.5135	2.1081	3.6757	3.5405	4.0556
3	3.1622	2.9730	2.3243	2.4324	3.2432	4.0278
4	3.1892	2.7838	2.5676	1.6216	3.3784	-
5	3.2973	-	2.0541	1.9730	-	-

This study uses a Likert scale of 1-5, which is a multilevel rating level of respondents' perceptions where 1 means strongly disagree to 5 strongly agree. Based on the table above, for the techno-overload variable, it can be seen that the average respondent is in the answer range of 3. One question item coded TO 2 with the wording "I am forced by this technology to do more tasks than what I can do". This statement was answered with fairly low agreement from respondents. For variables on the techno-invasion side, the average respondent had a preference for disagreeing with an average answer in the range of 2. For Techno-invasion item 2, "I feel that my personal life is disturbed because of this new technology" was answered with a fairly high level of agreement. The techno-complexity variable was also rated low by respondents with an average value of 2. Thus, it can be understood that respondents feel their work with technology is not so complex. The Techno-Insecurity variable received a very low response which ranged only to 1, which means they are close to disagreeing that the existence of new technology makes them feel insecure in their current position / position. The techno-uncertainty variable has a value close to 4 which indicates they agree. One of the question items for this dimension is "My campus always updates software regularly" this is agreed by respondents who mean at UNP there is uncertainty that arises in the future in the technology currently used.

Before conducting a regression test, it is necessary to test the validity of the construct. One way to see the validity is to pay attention to the factor loadings of each indicator. Table 2 below displays the factor loading results of each construct. From the data, it can be seen that there are 2 invalid items. The first is item T-Inv 2 from the techno-innovation dimension and the second is Tins 2 from the techno-security dimension. Furthermore, both indicators were excluded from the study.

Table 2. *Outer Loadings*

Indicator	JS	T-Inv	TO	Tcomp	Tins	Tuns
JS 1	0.669					
JS 2	0.851					
JS 3	0.840					
T Comp 3				0.815		
T Comp 4				0.789		
T Comp 5				0.834		
T Comp 1				0.640		
T comp 2				0.704		
T-Inv 1		0.916				

T-Inv 2		0.235			
T-Inv 4		0.779			
T-Inv3		0.784			
TO5			0.860		
TO1			0.824		
TO2			0.780		
TO3			0.872		
TO4			0.852		
Tins 1				0.666	
Tins 2				0.021	
Tins 3				0.683	
Tins 4				0.830	
Tins 5				0.725	
Tuns 1					0.604
Tuns 2					0.792
Tuns 3					0.861
Tuns 4					0.851

After the two Tinv 2 *(Techno-Invasion 1)* and Tins 2 *(Techno-Insecurity 2)* indicators were removed from the study, the validity test was carried out again with the existing data. The construct validity test carried out is by looking at the *Cronbach alpha* value, *composite reliability* and *Average variance extracted (AVE)*. The Cronbach alpha value of a construct is said to be valid when it has a value> 0.6. Composite reliability> 0.6 and AVE> 0.5. Table xx below are the analysis results for each construct that has met the criteria.

Table 3. Construct Validity

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Job Satisfaction	0.693	0.832	0.625
Techno- Invasion	0.846	0.885	0.721
Techno-Overload	0.899	0.922	0.703
Techno-Complexity	0.824	0.871	0.578
Techno-Insecurity	0.717	0.825	0.543
Techno-Uncertainty	0.784	0.862	0.614

After all validity tests are met, the data is considered feasible for further use for regression analysis. This study will examine the effect of *technostress* felt by lecturers and education personnel of FEB UNP on their job satisfaction. Previously, the average answers given by respondents on each dimension of *technostress* showed that the average level of stress felt was quite low. This fairly low stress will be tested for its effect on job satisfaction. Figure 1 below shows the research model analyzed in SEM-PLS 4 and Table xx below is the path coefficient value for each dimension of *technostress* on job satisfaction.
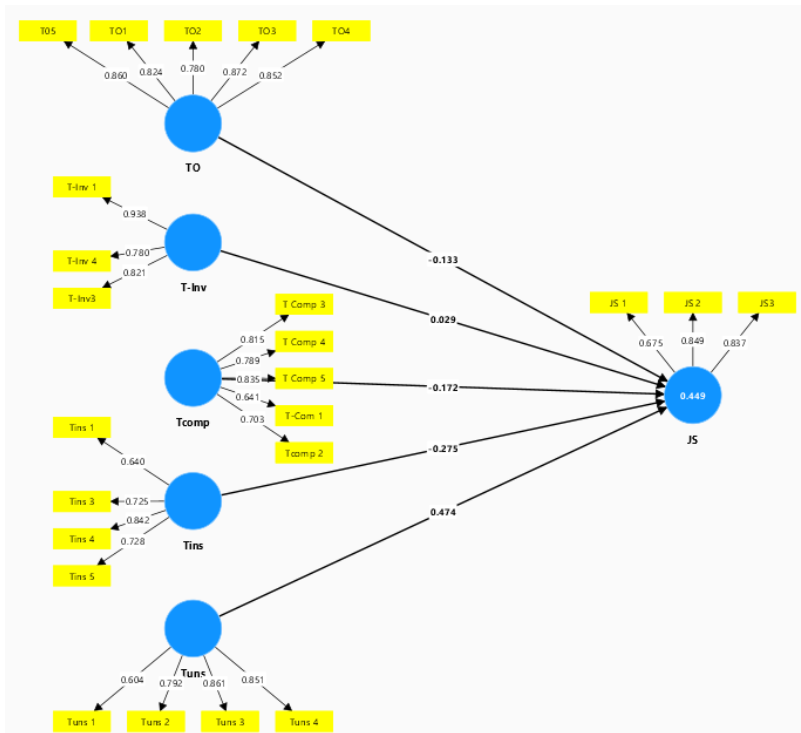
Figure 1. Research model and results of CFA and regression *path analysis* in SEM-PLS

Table 4. Path Coefficient

	Job Satisfaction
Techno-Invasion	0.029
Techno-Overload	-0.133
Techno-Complexity	-0.172
Techno-Insecurity	-0.275
Techno-Uncertainty	0.474

Based on the path analysis regression value, information is obtained that techno-invasion has a significant positive effect on job satisfaction. Techno-invasion is the feeling that technology interferes with personal life and rest time, the loss of boundaries between work and personal life. One of the question items related to this dimension is "I feel that my personal life is disturbed because of this new technology". The average respondent's answer for this dimension is 2, which means they disagree with the statement. So it can be understood that the higher the techno-invasion, the more this will increase their satisfaction even though by a fairly small amount of around 2% only. In other words, respondents feel that it is okay (even a slight increase in job satisfaction) if techno-invasion occurs to them. Furthermore, for the techno-overload variable, the regression value obtained is -0.133, which means that the effect of techno-overload on job satisfaction is negative. The higher the perceived techno-overload, the lower the job satisfaction. One of the indicators that measures this dimension is "I am forced by this technology to work in a short time". This means that the more work that is imposed due to the use of technology, the lower the respondents' job satisfaction will be. Furthermore, the techno-complexity variable has a value of -0.172. The negative value indicates that the higher the perceived techno-complexity, the lower the job satisfaction. One of the indicators that measure this dimension is "I often find it so difficult to understand and use technology". So, the more complex the job, the lower the job satisfaction. The regression result for techno-insecurity is -0.275. The negative value means that the higher the perceived techno-insecurity, the lower the level of job satisfaction felt. One of the indicators used in this dimension is "I feel there is a threat to my job continuity because of new technology". The more threatened the respondent feels because of new technology, the more dissatisfied the respondent is with their job. Furthermore, quite different from other dimensions, the techno-uncertainty dimension has a regression value of 0.474 and is positive. One of the question items for this dimension is "There are always new developments in the technology we use on this campus".

This means that the higher the techno-uncertainty, the higher the job satisfaction. The results of this analysis provide information that the uncertainty that exists in the future such as one of the technology updates is not a worrying thing anymore for the respondents because it could be that according to Ragu-Nathan (2008) there are situational factors that can become inhibitors that can reduce stress. For example, clear work procedures, clear informational sharing and social support in dealing with new technology are good, so the introduction of new technology is not a stressful thing.

The overall effect of these five dimensions of techno-overload on job satisfaction is 0.360 (can be seen from table 5). This means that 36% of job satisfaction is determined by the level of *technostress* felt by respondents. The remaining 64% is influenced by other variables outside this study.

Table 5. R-Square

	R-square	*Adjusted R-square*
Job Satisfaction	0.449	0.360

CONCLUSSION

This study found that the level of technostress of lecturers and education staff at FEB UNP is relatively low. Although at the end of the year they are required to complete various deadlines, based on the survey filled out, their technostress level is low. Based on the results of data processing, it was found that 2 of the technostress dimensions, namely techno-invasion and techno-uncertainty, had a positive effect on job satisfaction and 3 of them, namely techno-overload, techno-complexity, and techno-insecurity, had a negative effect on job satisfaction. This study has a weakness in the form of a small research sample. It is hoped that future research can explore differences in technostress in demographics, especially old and young age groups or different generations, conduct research with experimental designs on the use of new technology and the level of technostress felt, or specifically refer to technostress felt due to AI overload.

REFERENCES

Aktan O, Toraman Ç. The relationship between Technostress levels and job satisfaction of Teachers within the COVID-19 period. Educ Inf Technol (Dordr). 2022;27(7):10429-10453. doi: 10.1007/s10639-022-11027-2.

Al-Ansari, M. A. and Alshare, K. A. (2019). The impact of technostress components on the employees satisfaction and perceived performance. Journal of Global Information Management, 27(3), 65-86.

Amalia, W.R., Rimayanti, and Syahdan, S. A. (2023) Technostress dan Pengaruhnya terhadap kienerja dosen perguruan tinggi idi Indonesia. Jurnal Riset Akuntansi dan Bisnis.6(1), 34-45

Jena, Rabindra. 2015. Impact of Technostress on Job Satisfaction: An Empirical Study among Indian Academicians. The International Technology Management Review. doi:10.2991/itmr.2015.5.3.1

Khlaif, Z. N., Khalili, F., Affouneh, S., & Tlili, A. (2023a). How remote leaning during crisis affects *technostress* levels experienced by academicians. Education and Information Technologies, 28(9), 11075-11100.

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of *technostress* for end users in organizations: Conceptual development and empirical validation. *Information & management*, *45*(6), 417-424.

Ayyagari, R., Grover, V., & Purvis, R. (2011). *Technostress*: Technological antecedents and implications. *MIS quarterly*, 831-858.

Pothuganti Sanjeeva Kumar, TECHNOSTRESS: A comprehensive literature review on dimensions, impacts, and management strategies, Computers in Human Behavior Reports, Volume 16, 2024, 100475, ISSN 2451-9588, https://doi.org/10.1016/j.chbr.2024.100475.

Sugiyono. (2018). Quantitative Qualitative and R&D Research Methods. Bandung: Alfabeta

Urukovičová, Nina & Rošková, Eva & Schraggeova, Milica & Smoroň, Jozef. (2023). Psychometric properties of the Technostress Creators Inventory among employed Slovak respondents. Computers in Human Behavior Reports. 12. 100324. 10.1016/j.chbr.2023.100324.

Tarafdar, M., Pullins, E. B., & Ragu-Nathan, T. S. (2015). *Technostress*: Negative effects on performance and possible mitigations. Information Systems Journal, 25(2), 103-132.

Tarafdar, M., Tu, Q., & Ragu-Nathan, T. (2010). Impact of *technostress* on end-user satisfaction and performance. Journal of Management Information Systems, 27(3), 303-334.

Qi, C. (2019). A double-edged sword? Exploring the impact of students' academic usage of mobile devices on *technostress* and academic performance. Behav. Inform. Technol. 1-18.

Wang & Li. *Technostress* Among University Teachers in Higher Education: A Study Using Multidimensional Person-Environment Misfit Theory. Frontiers in psychology.