

Title	Technostress in workplace: A bibliometric Analysis of the last five decades of literature
Author(s)	Assadullah Memon, Jillian Yeow, Clara Cheung, & Erika Aminian
Contact Details	Department of Engineering Management, School of Engineering, University of Manchester, Oxford Rd, Manchester M13 9PL

Abstract

In today's contemporary workplace the use of information and communications technologies (ICT) is on the rise. The literature provides empirical evidence that the rise in ICT involvement has led to several challenges i.e., technostress which means technology-related stress for the employees. The emergent literature however adds a new perspective i.e., the positive side of technostress. The objective of the current paper is to delve into the last five decades of literature to understand how the technostress field has evolved, who the key authors are, and what seminal work has founded the foundations of the field. The study aims to use three databases: Scopus, Web of Science, and PubMed for data collection, and uses VOSviewer, and Scopus in-built analytical engine for bibliometric analysis.

The findings of this study are in developmental phase and the preliminary findings show a strong concentration of articles being published during and after 2019. The top two papers which are considered the seminal work in the field were produced by Ayyagari et al., (2011) followed by Ragu-Nathan et al., (2008). Also, the results showed that 37% scholars chose open-source publication during the period from 2000 – 2018. Overall, this paper aims to contribute to the growing body of literature on technostress by showing a holistic picture of the last fifty years to help researchers understand how we have reached the current state and what further areas could be explored in the future.

Keywords:

Technology related stress, technostress, technophobia, technoaddiction, bibliometric analysis, workplace.

Introduction

Technology has advanced in recent years and has seen a significant progression from telegraphy, telephone, radio, to recent digital technologies such as computers, tablets, mobile devices and the vast array of applications used on them (Thurik et al., 2023). Hoonakker (2014) reports that the recent advancement in the availability and accessibility of the internet and other computing technologies in recent decades is remarkable. One of the reasons of this

transformation is credited to technological advancement (Kohont & Ignjatović, 2022). Contemporary organisations rely significantly on technology (Choi, 2023) which has created an omnipresence of technology i.e., “techno-ubiquitous” (Asad et al., 2023, p. 01), hyper-connectivity which is today the standard operations (Choi, 2023) across firms. This expanded role of technology has led to higher demand on the employees to improve productivity and performance (Choi, 2023).

Technology use in the context of the workplace has significantly increased in recent decades (O'Driscoll et al., 2010) causing technology related stress (i.e., technostress) – a term first coined by Brod (1984). While technology provides the employees with much flexibility of working from anywhere and anytime (Sommovigo et al., 2023), it has simultaneously blurred the working boundaries as well (O'Driscoll et al., 2010). Additionally, the constant pressure of working more (Tarafdar et al., 2007), continuous interruptions (Chen et al., 2022), skill enhancement to align with newer technology requirements (Tarafdar et al., 2007), technical upgrades of systems thus creating more complexities (Califf & Brooks, 2020), and the threat of being replaced by systems (Tarafdar et al., 2011) exacerbates the technology related stress levels. Hoonakker (2014) concludes that it affects the working life of individuals.

Largely, the literature on technostress is shown with only a negative connotation (Nastjuk et al., 2023); however, it is argued by Tarafdar et al. (2019) technostress could lead to positive outcomes as well, i.e., techno-eustress. Techno-eustress is a form of stress but it creates more avenues as opportunities (Tarafdar et al., 2019) than hurdles. Literature supports the view that stress does not necessarily have to be negative, but can be contextually positive as well (Cavanaugh et al., 2000; Hargrove, 2013; LePine, 2022). Califf et al. (2020); Zhao et al. (2023, p. 01) define techno-eustress as positive stress. Tarafdar et al. (2019, p. 14) defines it as “positive stress that individuals face in their use of IS”.

Given the changing dynamics and how the field is rapidly evolving, it becomes important to understand how we got here and what the future holds for us. This study is an attempt to cover the last 5 decades of literature on the subject using multiple databases and identifying some key terminologies to help navigate to the relevant studies. Previous bibliometric analysis conducted on the same subject show an insightful picture of the technostress evolution; however, there is still room for improvement e.g., adding recent publications, adding more key terms to the search string, and addition of more literature databases instead of relying only on one database as the main source of truth. Rajput and Kumari (2023) conducted a bibliometric study to understand the impact of technologies and technostress on turnover intention. The focus of their study was on ‘turnover’ as it was the key search term used to collect data. Another

study performed by Uddin et al. (2023) focussed on technostress and its mapping on the research trends. Their study selected Scopus as the only database and limited their search results to 1986 – 2023. Furthermore, other studies on similar topic were performed by Salazar-Concha et al. (2021). Their study again used Scopus as the only database and capped their search results to 1982 – 2017. Grummeck-Braamt et al. (2021) study focussed on technostress and its historical roots and evolution. Their study focused on articles until 2019, and Bondanini et al. (2020) focussed article was on technostress as the dark side, and articles selection was performed from 1975 – 2019 using Web of Science as the database.

The commonality in above referenced bibliometric analysis is the use of a single database i.e., Scopus database; however, with exception to Bondanini et al. (2020) in which the authors selected Web of Science as the only selected database. Another commonality observed was in the use of search string e.g., “technostress”, and the latest study selected articles up till 2023 (Uddin et al., 2023). The current bibliometric study builds on the work of the earlier scholars and uses three different databases: Scopus, Web of Science, and PubMed. Moreover, other variants of the concept of technostress i.e., technophobia (Mesthene, 1980), and technoaddiction (Salanova et al., 2014) are also included as key search terms besides “technostress”.

Literature Review

To understand the key areas of this study i.e., technostress, we conducted a literature review of relevant studies which shows that the concept is still evolving and has not reached a maturity level (Salazar-Concha et al., 2021).

Technostress

Stress caused by the excessive use of technology is called techno-stress (Anderson, 1985). The term was originally used by Brod (1984, p. 16) to define it as "a modern disease of adaptation caused by an inability to cope with new computer technologies in a healthy manner". The term has evolved since its earlier inception in the 80s. The early literature used a variety of different terms to define the concept, some of which are “computer stress, computer anxiety, negative computer attitudes, computerphobia, cyberphobia, and technology aversion” (Pribbenow, 1999, p. 182). Another definition shows it as a “mental and physiological arousal observed in certain employees who are heavily dependent on computers in their work” (Arnetz & Wiholm, 1997, p. 36). Weil and Rosen (1997) cited in (Cini et al., 2023, p. 36) understood it as “adverse effect on attitudes, thoughts, behaviours or body physiology caused directly or indirectly by using technology”. Tarafdar et al. (2007, p. 302) uses the term as “stress created by Information

and Computer Technology (ICT)”. Ragu-Nathan et al. (2008) uses the term as “stress experienced by end users of Information and Communication Technologies (ICT)”. In a recent work conducted by Asad et al. (2023) add more variants such as the inability of the human to think, interpret and contemplate, uneasiness. Riedl et al. (2012, p. 61) add that existing literature shows that the engagement between the “human-computer” may cause noticeable perceptions of stress.

Methodology

Current study uses bibliometric analysis to analyse the data obtained from Scopus, Web of Science, and PubMed. Small (1997); Cobo et al. (2011) argue that bibliometrics helps to identify the intellectual connections between the evolving scientific knowledge. The current paper is in its developmental stages. The key-terms used as a search string was technostress, technophobia, and technoaddiction. All articles require a focus on technostress at the workplace. All the retrieved articles between 1975 – 2024 were extracted into an excel sheet which was cleaned for missing information. The articles collected from three databases: Scopus (1267), Web of Science (727), and PubMed (226). After initial screening for duplicates the final article count was 1253. The article count used for current bibliometric analysis is based on 1253 articles. The study uses Microsoft Excel, VOSviewer, and Scopus in-built analytics for the data analysis.

Analysis and Discussion

As mentioned earlier, this study is in its development phase hence full findings cannot be discussed at this stage. The preliminary findings are discussed in this section. Bibliometric analysis focusses on variables such as citation analysis, publication by year, authorship analysis and keyword analysis. In the current study we have relied primarily on VOSviewer, and an in-built analytical tool provided within Scopus database.

Publication Trend

The overall picture of the last 50 years (**Error! Reference source not found.** comprises of 1,253 articles. The article publication is based on five decades: For the current submission only two decades are briefly touched upon.

1. 1975 – 1985 – 09 articles

The first decade in the dataset shows nine articles starting with focus on how technology use is critical to survival. The article focusses on pesticide use in agriculture and how technology fear should be addressed for effective use of different pesticides (Knüsli, 1975). The articles in this dataset used terminology like technophobia (Frideres et al., 1983) and technostress (Brod,

1982). These are the two initial articles which introduced the concept of technology related stress in the literature. The focus of this period was more on the manageability aspect of technostress e.g., (Caro & Sethi, 1985; Feldman et al., 1985).

2. 1986 – 1996 – 43 articles

The second decade in the dataset discusses 43 articles. A significant jump from previous decade. The articles in this dataset focusses on two key terms- technostress and technophobia. The articles focussed on librarians (Bichteler, 1986), students (Ballance & Rogers, 1991), employees (Berg et al., 1992), school teachers (Rosen & Weil, 1995), and psychologist (Rosen & Weil, 1996). A paper was published by Arnetz (1996) discussing how there was a void in occupational workplace on technostress.

3. 1997 – 2007 – 77 articles

4. 2008 – 2018 – 296 articles

5. 2019 – 2024 – 828 articles

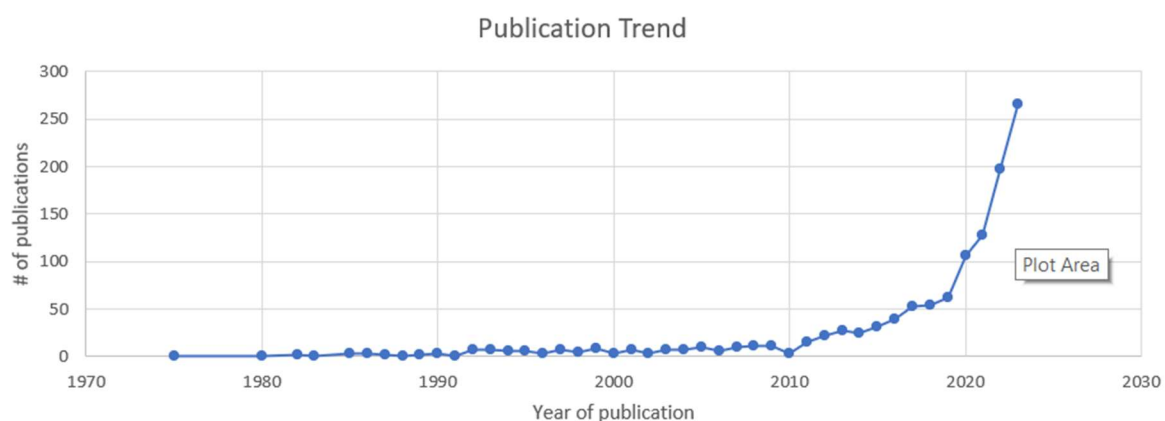


Figure 1 Publication Trend

Publications Type

Most of the studies published in the history of the last 50 years on the subject of technostress are of empirical papers (67%) as seen in Figure 2 comprising a publication record of 830 articles. The second publication trend is of conference proceedings (18.8%) and then small percentage of articles on book chapters and review papers, etc. This contribution is then added by other categories such as letter, editorials note, and erratum accumulating an insignificant percentage of (1%).

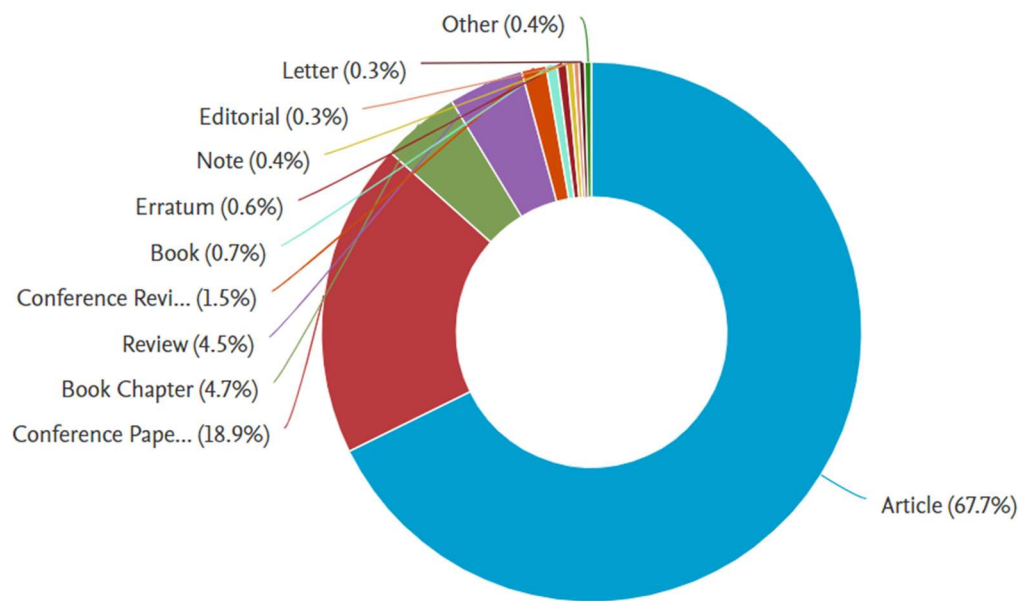


Figure 2 Publication Type

Publications by Author

As the current study is in its development stage; hence, top five scholars as seen in Figure 3 are briefly analysed and discussed. An initial analysis provides an understanding of each scholars' work and area of interest. Scholarship of Tarafdar is aligned to concepts such as dark side of technology, technology addiction, social networking sites, technology-enabled innovation/ performance and much more. Scholarship of Maier is aligned to concepts such as coping behaviour, social networking sites, and job burnout. Furthermore, scholarship of Weitzel is aligned to concepts such as social networking sites, coping behaviours. Scholarship of Riedl is aligned to stress and arguably is the first to connect the concept of technostress and how individuals behave in physiological sense. Scholarship of Laumer is aligned to user resistance to change, personality traits, IT mindfulness interventions, social networking sites, coping behaviours etc., It is observed that social networking sites is also amongst the few topics which connect most of the scholars together as they co-authored a paper on it.

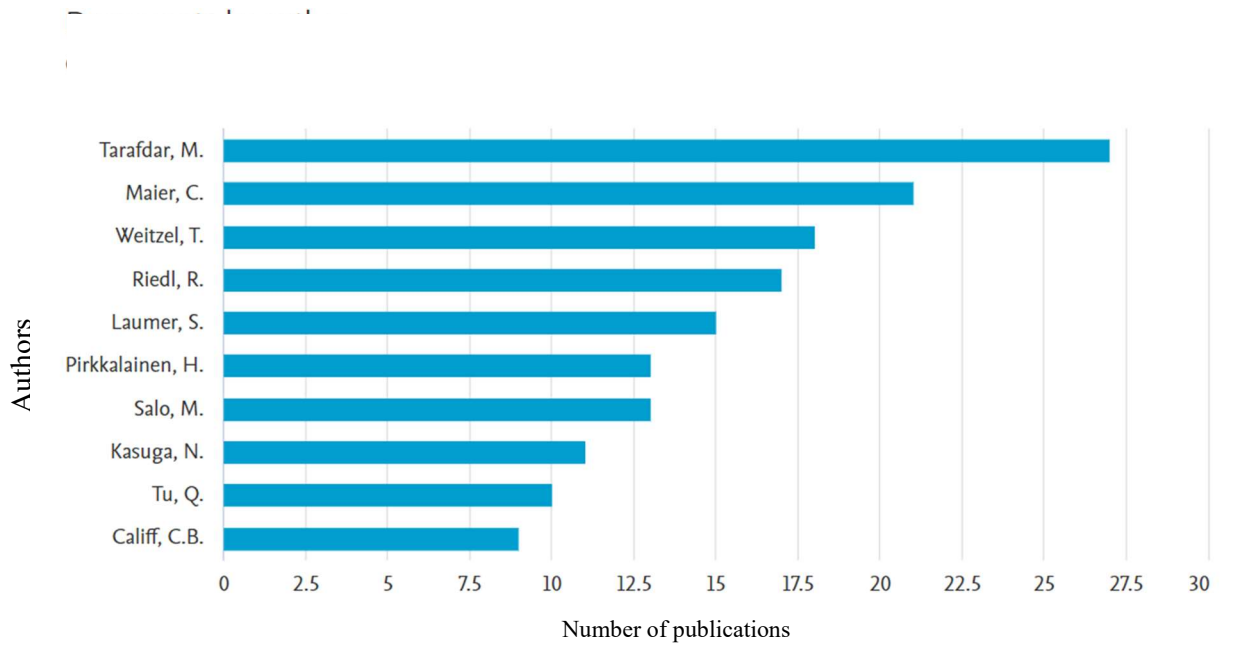


Figure 3 Publications by Authors

Publication by Subject Area

The larger chunk of the pie-chart as shown in Figure 4 is attributed to computer science, social science, business management, while a small percentage is attributed to psychology, medicine, and so on. Further review of the individual categories show that Computer Science cluster shows that the recent 2021 article publication focussed on Covid and university students. Literature supports that many scholars focussed on this sample (i.e., university students) (Kulikowski et al., 2022; Whelan et al., 2022) as they were the most affected because of the online education system change seen during the Covid crises. Other key areas in this cluster are mindfulness programme (Ioannou et al., 2022; Nascimento et al., 2023), work-family conflict (Cataldo et al., 2023; Kashive et al., 2023), burnout (Dehghan, 2023), remote working (Ugar, 2023) and much of the techno-stressors discuss techno-invasion (Yao & Wang, 2023). The next cluster in this pie-chart is by social sciences with 512 articles discussing academic performance, teachers, higher education, remote working, online learning, technostress creators in the recent publications. The general observation is that both these clusters have many overlapping concepts which have been studied.

The final cluster that we will discuss in this pie-chart is of business and management with 249 articles which discuss concepts similar to the other two mentioned above. Some of the other concepts which this category discusses is on digital transformation, self-efficacy attributed to the publication of 2023.

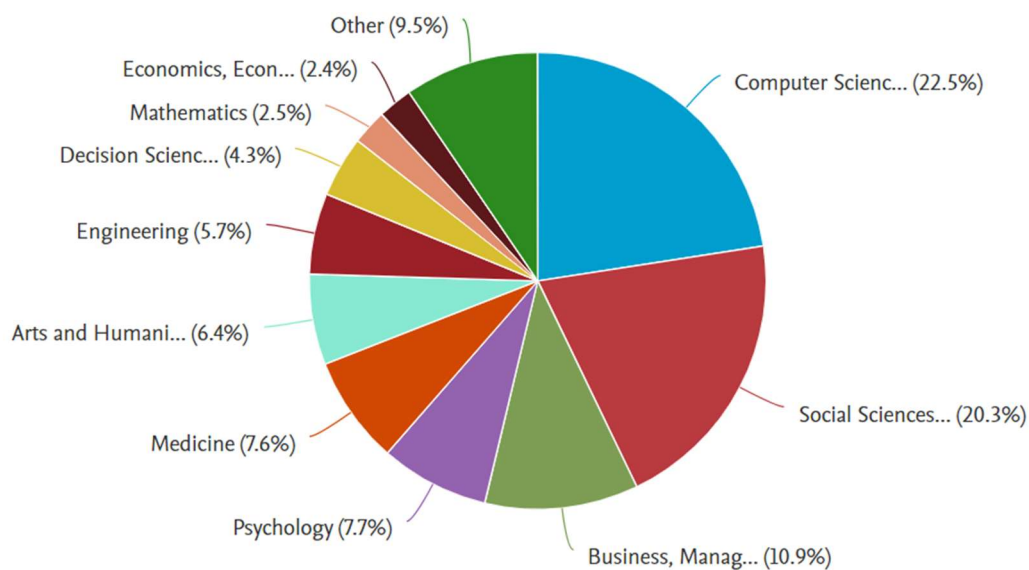


Figure 4 Publication by Subject Area

Top Publication Analysis (citation analysis)

The citation analysis helps to understand the citation mapping of how different authors and their work are cited by other scholars in the field. Figure 5 shows the top five scholarships which received the highest citations. The paper by Ayyagari et al. (2011) Technostress: Technological antecedents and implications received the highest citations 1103; while the article by Ragu-Nathan (2008) The consequences of technostress for end users in organizations: Conceptual development and validation received 1020 citations. Tarafdar et al. (2007) The impact of technostress on role stress and productivity received 792 citations. Lee et al. (2014) The dark side of smartphone usage: Psychological traits, compulsive behaviour and technostress showed 607 citations, and Tarafdar et al. (2010) Impact of technostress on end-user satisfaction and performance showed 536 citations. Given the citation count the above five scholars have received on their publication makes these papers seminal paper in the field and provides good ground for the extension of technostress knowledge further into new avenues.

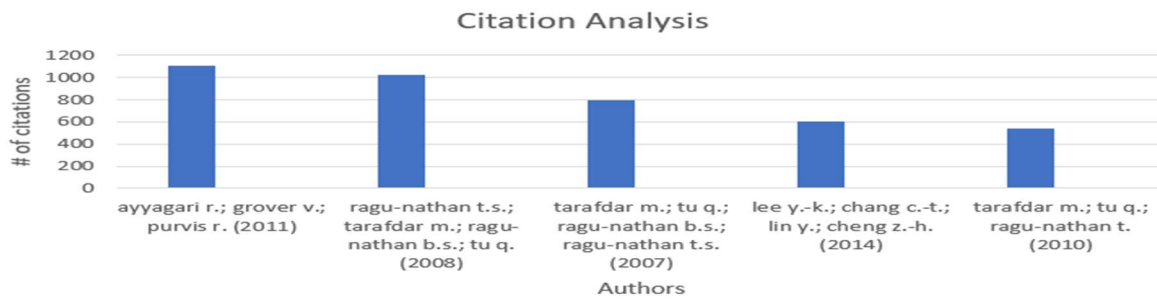


Figure 5 Top Cited Publication Analysis

The top journals in the field

Table -0-1 Top 10 Journal Publication, shows the top scholarship journals selected in the last five decades of literature.

Journal Name	Frequency
Computers in Human Behaviour	42
Frontiers in Psychology	29
International Journal of Environmental Research and Public Health	28
Proceedings of the Annual Hawaii International Conference on System Sciences	28
Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	20
Information Technology and People	19
Sustainability (Switzerland)	11
Behaviour and Information Technology	11
Lecture Notes in Information Systems and Organisation	11
Japanese Journal of Psychosomatic Medicine	10

Table -0-1 Top 10 Journal Publication

Another observation noticed is that 37% of the scholars published work in Open Access journals. The top five of them are listed for reference (See: Table 0-2 Open-Access Journals).

Authors	Title	Year	Source title	Cited by	Open Access
D'Arcy J.; Gupta A.; Tarafdar M.; Turel O.	Reflecting on the "Dark side" of information technology use	2014	Communications of the Association for Information Systems	120	All Open Access; Bronze Open Access
Tams S.; Thatcher J.B.; Grover V.	Concentration, competence, confidence, and capture: An experimental study of age, interruption-based technostress, and task performance	2018	Journal of the Association for Information Systems	91	All Open Access; Bronze Open Access
Fischer T.; Riedl R.	Technostress research: A nurturing ground for measurement pluralism?	2017	Communications of the Association for Information Systems	75	All Open Access; Bronze Open Access
Dixon L.J.; Correa T.; Straubhaar J.; Covarrubias L.; Graber D.; Spence J.; Rojas V.	Gendered Space: The digital divide between male and female users in internet public access sites	2014	Journal of Computer-Mediated Communication	60	All Open Access; Bronze Open Access
Anthony L.M.; Clarke M.C.; Anderson S.J.	Technophobia and personality subtypes in a sample of South African university students	2000	Computers in Human Behaviour	55	All Open Access; Bronze Open Access

Table 0-2 Open-Access Journals

Keyword Co-occurrence Analysis

There are seven clusters which have been identified based on different time periods. The first cluster is aligned to the period of 2022 in which the studies contain articles focussing on coping, covid, digital transformation, productivity, remote working and technostress. An initial observation which stood out is that coping behaviours were used as key concepts until 2018

and did not appear in recent publication trends. This requires further exploration as complete analysis is still underway; hence, this observation might be addressed in the finalised version of this paper. The second cluster is aligned to the period of 2021 in which studies contain articles focussing on information overload, mental health, social media, well-being and work engagement. Information overload, however, is seen in the earlier phase of this period and did not surface again. The third cluster is aligned to the period of 2018 in which studies contain articles focussing on artificial intelligence, computer anxiety, technology, technophobia. This cluster has an overlap with timeframe 2021 because of artificial intelligence. The fourth cluster is aligned to the period of 2017 in which studies contain0 articles focussing on higher education, ICT, teachers. This cluster overlaps with timeframe 2021 because of the involvement of teachers as their sample. The fifth cluster is aligned to 2018 as well. The key concept discussed in this cluster is on Information technology; other concepts focus on Covid-19, and remote working, etc. The sixth cluster is also connected to 2018 and contains articles focussing on job satisfaction, technostress creators. The last seventh cluster is more aligned to 2019 and contain studies focussing on burnout and stress.

One key observation here is that many of the clusters are overlapping with each other; especially the last three clusters 5,6, and 7. Mainly because of the key concepts associated within each cluster. This section is important and as stated earlier requires further exploration to understand the key connections and how the subject has evolved in the previous five decades.

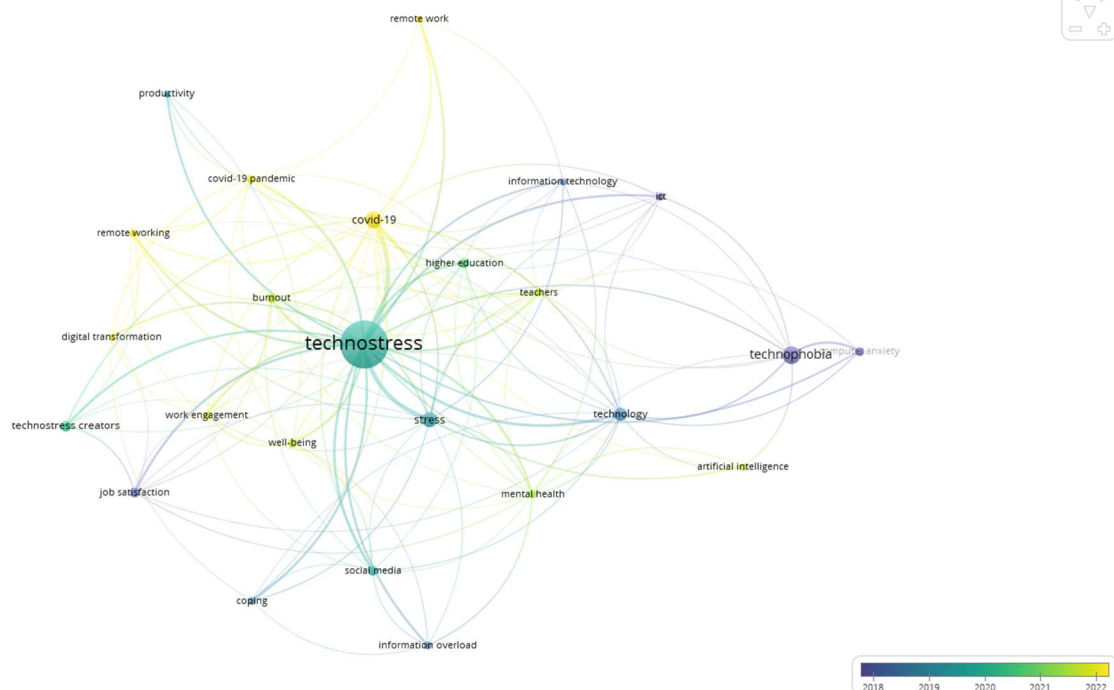


Figure 6 Keyword Co-occurrence Analysis

Strengths, Limitation and Future Directions

At present the study is in its development phase, hence, could not yield a comprehensive review of collected data for bibliometric analysis. The current study is an attempt to further the work of previous scholars by unfolding new areas within the field and provide opportunities for future research. The study added new search keywords and took the task to add more articles from recent publications.

The study has some limitations. First, the current work is in development stage hence a comprehensive review was not possible. Second, the study could not explore options of adding more databases due to different resource constraints. It could be argued that further review of other databased might provide some new insights not discussed earlier.

Given the recent increase in the count of publications on technostress it suggests how much relevant the topic has become in the contemporary workplace. The keyword analysis showed an emphasis on use of technology, technostress creators, burnout, job satisfaction, social media, higher education, well-being and coping behaviours. Given that this trend continues, more scholars will continue in this line of concepts. Moreover, some key areas highlighted from within the review of the literature suggests more focus on instant messaging and its relationship with technostress and work-related performance and well-being (Hurbean et al., 2022). Interestingly, well-being at the employee level is relatively less studied, and it might be a prudent decision to break-down the techno-stressors in separate components (Hang, 2022). Public sector seems to have been not studied at length (Camarena & Fusi, 2022). Another interesting gap which reflects the scant empirical evidence is the personal use of technology and its effects on work (Singh et al., 2022). Last but not the least, not many studies focussed on technostress in the context of flexible working and its effects on well-being and job satisfaction (Camacho & Barrios, 2022).

Conclusion

The growing trend of technology use at the workplace continues to benefit employees and employer together, but also positions itself as a negative influence on employees as well. It is argued in the literature that many a times this leads to technostress which is contextual in nature i.e., can have positive as well as negative effects on individuals. We observed that most of the concentration of the scholarship has been in the last few years connected to the Covid period. The top five contributors in the field cited by Scopus analytic are Tarafdar; Maier; Weitzel, Riedl, and Laumer, while the top most cited papers in the field are: Technostress: Technological antecedents and implications (2011); The consequences of technostress for end

users in organizations: Conceptual development and validation (2008); The impact of technostress on role stress and productivity (2007); The dark side of smartphone usage: Psychological traits, compulsive behaviour and technostress (2014); and Impact of technostress on end-user satisfaction and performance (2010).

As we have already informed that this work is still in development stages, but we have attempted to provide an evolution of the field on technostress with preliminary findings from one data base and attempted to produce some insightful findings in the study. We do however invite readers of this paper to provide us your feedback and suggestions for improvement and refinement of this study. All comments received will be welcomed and will provide us to make room for contributing to this field.

Reference

- Anderson, A. (1985). Technostress: another Japanese discovery. *Nature*, 317(6032), 6.
- Arnetz, B. B. (1996). Techno-stress: A prospective psychophysiological study of the impact of a controlled stress-reduction program in advanced telecommunication systems design work [Article]. *Journal of Occupational and Environmental Medicine*, 38(1), 53-65. <https://doi.org/10.1097/00043764-199601000-00017>
- Arnetz, B. B., & Wiholm, C. (1997). Technological stress: Psychophysiological symptoms in modern offices. *Journal of Psychosomatic Research*, 43(1), 35-42.
- Asad, M. M., Erum, D., Churi, P., & Moreno Guerrero, A. J. (2023). Effect of technostress on Psychological well-being of post-graduate students: A perspective and correlational study of Higher Education Management [Article]. *International Journal of Information Management Data Insights*, 3(1), Article 100149. <https://doi.org/10.1016/j.jjime.2022.100149>
- Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: Technological antecedents and implications. *MIS quarterly*, 831-858.
- Ballance, C. T., & Rogers, S. U. (1991). Psychology of computer use: XXIV. Computer-related stress among technical college students. *Psychological reports*, 69(2), 539-542.
- Berg, M., Arnetz, B. B., Lidén, S., Eneroth, P., & Kallner, A. (1992). Techno-Stress: A psychophysiological study of employees with VDU-associated skin complaints [Article]. *Journal of Occupational Medicine*, 34(7), 698-701. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-0026650028&partnerID=40&md5=eb2100f32bc9d86bd3f195f38b793eb1>
- Bichteler, J. (1986). Human aspects of high tech in special libraries. *Special Libraries*, 77(3), 121-128.
- Bondanini, G., Giorgi, G., Ariza-Montes, A., Vega-Muñoz, A., & Andreucci-Annunziata, P. (2020). Technostress dark side of technology in the workplace: a scientometric analysis [Review]. *International journal of environmental research and public health*, 17(21), 1-25, Article 8013. <https://doi.org/10.3390/ijerph17218013>
- Brod, C. (1982). Managing technostress: optimizing the use of computer technology. *Personnel Journal*, 61(10), 753-757.
- Brod, C. (1984). *Technostress: The Human cost of the Computer Revolution*.

- Califf, C. B., & Brooks, S. (2020). An empirical study of techno-stressors, literacy facilitation, burnout, and turnover intention as experienced by K-12 teachers. *Computers & Education*, 157, 103971.
- Califf, C. B., Sarker, S., & Sarker, S. (2020). The bright and dark sides of technostress: A mixed-methods study involving healthcare IT. *MIS quarterly*, 44(2).
- Camacho, S., & Barrios, A. (2022). Teleworking and technostress: early consequences of a COVID-19 lockdown [Article]. *Cognition, Technology and Work*, 24(3), 441-457. <https://doi.org/10.1007/s10111-022-00693-4>
- Camarena, L., & Fusi, F. (2022). Always Connected: Technology Use Increases Technostress Among Public Managers [Article]. *American Review of Public Administration*, 52(2), 154-168. <https://doi.org/10.1177/02750740211050387>
- Caro, D. H., & Sethi, A. S. (1985). Strategic management of technostress: The chaining of Prometheus. *Journal of Medical Systems*, 9, 291-304.
- Cataldo, A., Bravo-Adasme, N., Araya, P., & Ormeño, V. (2023). Why university students are technostressed with remote classes: Study-Family conflict, satisfaction with university life, and academic performance. *Telematics and Informatics*, 80, 101982.
- Cavanaugh, M. A., Boswell, W. R., Roehling, M. V., & Boudreau, J. W. (2000). An empirical examination of self-reported work stress among US managers. *Journal of Applied Psychology*, 85(1), 65.
- Chen, C. Y., Byrne, E., & Vélez, T. (2022). A Preliminary Study of COVID-19-related Stressors, Parenting Stress, and Parental Psychological Well-being Among Parents of School-age Children. *J Child Fam Stud*, 31(6), 1558-1569. <https://doi.org/10.1007/s10826-022-02321-1>
- Choi, Y. (2023). Exploring the impact of technostress on work behaviors: Empirical evidence and interventions for enhanced workplace well-being [Article]. *Information Development*. <https://doi.org/10.1177/02666669231206763>
- Cini, M., Erdirençelebi, M., & Akman, A. (2023). The Effect of Organisation Employees' perspective on digital Transformation on their Technostress Levels and Performance: The Public Institutions Example.
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for information Science and Technology*, 62(7), 1382-1402.

- Dehghan, F. (2023). How Can Social Media Affect EFL Teachers' Digital Well-Being and Digital Burnout? In *Perspectives on Digital Burnout in Second Language Acquisition* (pp. 149-168). IGI Global.
- Feldman, R. H. L., Hollander, R. B., & Rezmovic, V. (1985). Overcoming technophobia: The joys and anguish of computers in health education [Article]. *Health Education*, 16(6), 45-46. <https://doi.org/10.1080/00970050.1986.10614488>
- Frideres, J. S., Goldenberg, S., Disanto, J., & Fleising, U. (1983). Technophobia: Incidence and potential causal factors [Article]. *Social indicators research*, 13(4), 381-393. <https://doi.org/10.1007/BF00318077>
- Grummeck-Braamt, J. V., Nastjuk, I., Najmaei, A., & Adam, M. T. P. (2021). A bibliometric review of technostress: Historical roots, evolution and central publications of a growing research field. Proceedings of the Annual Hawaii International Conference on System Sciences,
- Hang, Y., Hussain, G., Amin, A., & Abdullah, M. I. (2022). The moderating effects of technostress inhibitors on techno-stressors and employee's well-being. *Frontiers in Psychology*, 12.
- Hargrove, M. B. (2013). Generating eustress by challenging employees: Helping people savor their work. *Organizational Dynamics*. 42, 61-69. *Organizational Dynamics*, 42, 61-69.
- Hoonakker, P. (2014). Information and communication technology and quality of working life: Backgrounds, facts, and figures. In *The impact of ICT on quality of working life* (pp. 9-23). Springer.
- Hurbean, L., Dospinescu, O., Munteanu, V., & Danaiaata, D. (2022). Effects of Instant Messaging Related Technostress on Work Performance and Well-Being [Article]. *Electronics (Switzerland)*, 11(16), Article 2535. <https://doi.org/10.3390/electronics11162535>
- Ioannou, A., Lycett, M., & Marshan, A. (2022). The Role of Mindfulness in Mitigating the Negative Consequences of Technostress [Article]. *Information Systems Frontiers*. <https://doi.org/10.1007/s10796-021-10239-0>
- Kashive, N., Sharma, B., & Khanna, V. T. (2023). Work from home: understanding boundary management profiles using boundary-fit perspective. *International Journal of Organizational Analysis*, 31(5), 1776-1801.
- Knüsli, E. (1975). The future of the development of pesticides by industry [Article]. *Pure and Applied Chemistry*, 42(1-2), 77-87. <https://doi.org/10.1351/pac197542010077>

- Kohont, A., & Ignjatović, M. (2022). Organizational Support of Working from Home: Aftermath of COVID-19 from the Perspective of Workers and Leaders [Article]. *Sustainability (Switzerland)*, 14(9), Article 5107. <https://doi.org/10.3390/su14095107>
- Kulikowski, K., Sułkowski, Ł., Przytuła, S., & Rašticová, M. (2022). TECHNOSTRESS OF STUDENTS DURING COVID-19-A SIGN OF THE TIME? [Article]. *Human Technology*, 18(3), 234-249. <https://doi.org/10.14254/1795-6889.2022.18-3.3>
- Lee, Y.-K., Chang, C.-T., Lin, Y., & Cheng, Z.-H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior*, 31, 373-383.
- LePine, M. A. (2022). The challenge-hindrance stressor framework: an integrative conceptual review and path forward. *Group & Organization Management*, 47(2), 223-254.
- Mesthene, E. G. (1980). Morose technophobia. *Society*, 17(3), 15-16.
- Nascimento, L., Correia, M. F., & Califf, C. B. (2023). Towards a bright side of technostress in higher education teachers: Identifying several antecedents and outcomes of technostress. *Technology in Society*, 102428.
- Nastjuk, I., Trang, S., Grummeck-Braamt, J.-V., Adam, M. T., & Tarafdar, M. (2023). Integrating and synthesising technostress research: a meta-analysis on technostress creators, outcomes, and IS usage contexts. *European Journal of Information Systems*, 1-22.
- O'Driscoll, M. P., Brough, P., Timms, C., & Sawang, S. (2010). Engagement with information and communication technology and psychological well-being. In *New developments in theoretical and conceptual approaches to job stress* (pp. 269-316). Emerald Group Publishing Limited.
- Pribbenow, K. (1999). Maintaining balance: Mile-high expectations vs. technostress. Proceedings of the 27th annual ACM SIGUCCS conference on User services: Mile high expectations,
- Ragu-Nathan, T. (2008). Ragu-Nathan and Tu, 2008 Ragu-Nathan TS, Tarafdar M., Ragu-Nathan BS, Tu Q. *The consequences of technostress for end users in organizations: Conceptual development and empirical validation*, *Information Systems Research*, 19(4), 417-433.
- Ragu-Nathan, T., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information Systems Research*, 19(4), 417-433.

- Rajput, S., & Kumari, U. (2023). Impact of Technologies and Technostress on Turnover Intention: A Bibliometric Analysis. Proceedings of the 8th International Conference on Communication and Electronics Systems, ICCES 2023,
- Riedl, R., Kindermann, H., Auinger, A., & Javor, A. (2012). Technostress from a neurobiological perspective: System breakdown increases the stress hormone cortisol in computer users. *Wirtschaftsinformatik*, 54, 59-68.
- Rosen, L. D., & Weil, M. M. (1995). Computer availability, computer experience and technophobia among public school teachers. *Computers in Human Behavior*, 11(1), 9-31.
- Rosen, L. D., & Weil, M. M. (1996). Psychologists and technology: A look at the future. *Professional Psychology-Research and Practice*, 27(6), 635-638. <https://doi.org/10.1037/0735-7028.27.6.635>
- Salanova, M., Llorens, S., & Ventura, M. (2014). Technostress: The dark side of technologies. In *The impact of ICT on quality of working life* (pp. 87-103). Springer.
- Salazar-Concha, C., Ficapal-Cusí, P., Boada-Grau, J., & Camacho, L. J. (2021). Analyzing the evolution of technostress: A science mapping approach [Article]. *Heliyon*, 7(4), Article e06726. <https://doi.org/10.1016/j.heliyon.2021.e06726>
- Singh, P., Bala, H., Dey, B. L., & Filieri, R. (2022). Enforced remote working: The impact of digital platform-induced stress and remote working experience on technology exhaustion and subjective wellbeing [Article]. *Journal of Business Research*, 151, 269-286. <https://doi.org/10.1016/j.jbusres.2022.07.002>
- Small, H. (1997). Update on science mapping: Creating large document spaces. *Scientometrics*, 38, 275-293.
- Sommovigo, V., Bernuzzi, C., Finstad, G. L., Setti, I., Gabanelli, P., Giorgi, G., & Fiabane, E. (2023). How and When May Technostress Impact Workers' Psycho-Physical Health and Work-Family Interface? A Study during the COVID-19 Pandemic in Italy [Article]. *International journal of environmental research and public health*, 20(2), Article 1266. <https://doi.org/10.3390/ijerph20021266>
- Tarafdar, M., Cooper, C. L., & Stich, J. F. (2019). The technostress trifecta-techno eustress, techno distress and design: Theoretical directions and an agenda for research. *Information Systems Journal*, 29(1), 6-42.
- Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. (2007). The impact of technostress on role stress and productivity. *Journal of management information systems*, 24(1), 301-328.

- 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.
- Tarafdar, M., Tu, Q., Ragu-Nathan, T., & Ragu-Nathan, B. S. (2011). Crossing to the dark side: examining creators, outcomes, and inhibitors of technostress. *Communications of the ACM*, 54(9), 113-120.
- Thurik, R., Benzari, A., Fisch, C., Mukerjee, J., & Torrès, O. (2023). Techno-overload and well-being of French small business owners: identifying the flipside of digital technologies. *Entrepreneurship & Regional Development*, 1-26.
- Uddin, M. J., Ferdous, M., Rahaman, A., & Ahmad, S. (2023). Mapping of Technostress Research Trends: A Bibliometric Analysis. Proceedings of the 7th International Conference on Intelligent Computing and Control Systems, ICICCS 2023,
- Ugar, E. T. (2023). Rethinking Remote Work, Automated Technologies, Meaningful Work and the Future of Work: Making a Case for Relationality. *Philosophy & Technology*, 36(2), 32.
- Weil, M. M., & Rosen, L. D. (1997). *Technostress: Coping with technology@ work@ home@ play* (Vol. 13). J. Wiley New York.
- Whelan, E., Golden, W., & Tarafdar, M. (2022). How technostress and self-control of social networking sites affect academic achievement and wellbeing. *Internet Research*, 32(7), 280-306.
- Yao, N., & Wang, Q. (2023). Technostress from smartphone use and its impact on university students' sleep quality and academic performance. *The Asia-Pacific Education Researcher*, 32(3), 317-326.
- Zhao, Y., Li, Y., & Bandyopadhyay, K. (2023). The Role of Techno-Eustress in Technology-Enhanced IT Learning. *Journal of Computer Information Systems*, 1-15.