

Technostress and Electronic Resource Utilization: Challenges and Implications for Undergraduate Students at Federal University Lokoja

by

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Abstract

The integration of Information and Communication Technology (ICT) in higher education has revolutionized access to information, yet it has introduced the phenomenon of "technostress." This study investigates the indicators of technostress and its impact on electronic resource utilization among undergraduate students at Federal University Lokoja (FUL). The population comprised 728 undergraduate students from the Library and Information Science department, from which a sample of 191 students was drawn. Data were collected using a structured questionnaire and analyzed using descriptive statistics and Chi-square tests. Results indicate a significant negative relationship between technostress and electronic resource utilization ($r = -0.4256$, $r^2 = 0.2103$). Key stressors identified include techno-overload and techno-complexity. While students demonstrated competence with general databases, proficiency declined with specialized tools like the Online Public Access Catalogue (OPAC). The study concludes that technostress significantly hinders academic performance and resource engagement. It recommends targeted interventions, including simplified user interfaces, comprehensive digital literacy training, and institutional mental health support to mitigate these challenges.

Keywords: Technostress, Electronic Resources, Digital Literacy, Academic Performance, Higher Education, Nigeria.

Introduction

The digital transformation of higher education has offered students unprecedented access to vast arrays of digital resources. While platforms like online databases and e-journals enrich learning and research, they have also introduced technostress the strain experienced when adapting to rapid technological change. This phenomenon, characterized by information overload and technological complexity, significantly impacts student well-being and academic performance. At the Federal University Lokoja (FUL), a wide range of electronic resources is available, yet many students struggle with their complexities. This struggle transcends mere technical difficulties, manifesting as anxiety, uncertainty, and mental strain. Such psychological impacts impede students' ability to navigate digital tools effectively, which is particularly concerning where resource utilization is critical for academic achievement. Existing research demonstrates a strong negative correlation between technostress and academic performance. Studies by Agogo and Hess (2018), Mahapatra et al. (2023), and Schettino et al. (2022) highlight how technostress symptoms hinder students' ability to leverage electronic resources. These technological pressures can undermine the quality of education and diminish learning outcomes. Furthermore, the digital divide exacerbates these issues; students from disadvantaged backgrounds face additional barriers to access and skill development, increasing their stress levels. This highlights the urgent need for universities to provide equitable access to technology and comprehensive support services. This study investigates the indicators of technostress and its impact on electronic resource utilization among FUL undergraduate students to understand how specific stressors affect their ability to leverage digital tools and to inform targeted interventions.

Statement of the Problem

ICT integration in higher education has introduced technostress, hindering students at Federal University Lokoja (FUL) from effectively utilizing electronic resources. Empirical evidence, such as that provided by Rabi (2021), Upadhyaya and Vrinda (2021) and Mahapatra et al. (2023), demonstrates that information overload and system complexity cause anxiety, which negatively impacts academic performance and well-being. However, previous studies have predominantly focused on general online learning environments or corporate organizational settings. There is a conspicuous lack of empirical evidence examining how specific technostress indicators (such as techno-complexity and techno-overload) uniquely hinder the utilization of specialized academic electronic resources, like OPACs and Electronic Theses and Dissertations (ETDs), in Nigerian federal universities. Furthermore, previous research has failed to address the specific behavioral impacts such as the

complete avoidance of electronic resources within the FUL context. This study investigates technostress indicators and their impact on resource usage at FUL, seeking to identify interventions that mitigate these challenges and enhance the learning experience.

Objectives of the Study

The primary objective of this study is to examine the impact of technostress on the utilization of electronic resources among students at Federal University Lokoja (FUL). The specific objectives are to:

1. Assess the level of electronic information search competence among FUL students.
2. Identify key indicators of technostress experienced during resource access.
3. Analyze how these stressors correlate with students' academic performance and engagement levels.
4. Recommend actionable strategies to mitigate technostress and enhance students' overall engagement with digital academic tools.

Research Questions

1. What is the level of electronic information search competence among FUL students?
2. What are the major indicators of technostress prevalent among the FUL student body?
3. How do technostress indicators correlate with students' academic performance and engagement levels?
4. What strategies can be implemented to mitigate technostress?

Literature Review

Concept of Technostress Technostress describes the detrimental effects of technology on well-being, arising from excessive exposure to digital devices and information. Research utilizing the transaction-based stress model reveals that technostress stems from a complex interplay between individuals and technology, resulting in adverse effects on behavior, attitudes, and psychological well-being (Bondanini et al., 2020; Nastjuk et al., 2024). Tarafdar et al. (2019) proposed a

framework distinguishing between positive (techno-eustress) and negative (techno-distress) responses to information systems. In educational settings, technostress negatively impacts cognitive processing and emotional stability, making it a critical barrier to digital learning.

Level of Digital Competence in E-Resource Utilization Digital literacy skills are fundamental for academic success, as students without these skills encounter considerable challenges (Warschauer, 2018). Competence in utilizing electronic resources varies significantly based on the complexity of the platform. While students may easily navigate commercial search engines and general online databases, their proficiency typically declines when interacting with specialized academic infrastructure like OPACs and institutional repositories, which require an understanding of structured search protocols and Boolean logic (Olorunfemi & Adekoya, 2023).

Indicators of Technostress Technostress is triggered by diverse technological interactions. Key indicators include techno-overload (work overload induced by ICT), techno-invasion (technology encroaching on personal life), techno-complexity (difficulty using complex technology), techno-insecurity (fear of losing data or status), and techno-uncertainty (stress from rapid changes) (Borle et al., 2021; Upadhyaya & Vrinda, 2021). In academic contexts, techno-overload and techno-complexity are frequently identified as the most prevalent stressors, as students struggle to process massive volumes of data while navigating unintuitive library interfaces (Zhao et al., 2023).

Challenges of Technostress on Academic Performance The challenges posed by technostress directly impair academic performance and engagement. Agogo and Hess (2018) found that technology-induced state anxiety leads to reduced productivity and cognitive fatigue. Similarly, Mahapatra et al. (2023) confirmed a significant negative relationship between technostress and academic outcomes, noting that stressed students often exhibit avoidance behaviors, completely abandoning electronic resources in favor of traditional, less efficient methods. Schettino et al. (2022) highlighted that frustration with digital platforms leads to decreased motivation and increased errors in academic tasks.

Strategies for Mitigating Technostress Mitigating technostress requires both systemic institutional interventions and personal coping strategies. Livingstone (2022) emphasizes the need for digital literacy training to bridge the competency gap. Ragnedda (2019) suggests that institutions must simplify user interfaces to reduce techno-complexity. Furthermore, providing robust technical support and

mental health services has been identified as crucial for helping students manage the psychological toll of the digital academic environment (Nastjuk et al., 2024).

Research Methodology

This study adopted a descriptive survey design to analyze the link between technostress and electronic resource utilization among undergraduate students at Federal University Lokoja (FUL). The target population consisted of 728 registered undergraduate students in the Library and Information Science department for the 2023/2024 and 2024/2025 academic sessions. Using the Yamane (1967) statistical formula at a 0.05 margin of error, a sample size of 258 respondents was determined. Data were collected using a structured questionnaire containing closed-ended questions. The instrument was validated by experts and pre-tested, achieving a Cronbach's Alpha reliability coefficient of 0.87, indicating high internal consistency. Of the 258 distributed questionnaires, 191 were retrieved and deemed usable, yielding a 74% response rate. A mean score of 2.50 was adopted as the decision benchmark; items with mean scores of 2.50 and above were considered agreed/high, while items below 2.50 were considered disagreed/low. Data were analyzed using frequency counts, mean, and standard deviation to answer the research questions. The lone hypothesis was tested using Chi-square at a 0.05 level of significance.

Hypothesis Testing

H₀₁: There is no significant relationship between technostress and electronic resource utilization among FUL students.

H₁₁: There is a significant relationship between technostress and electronic resource utilization among FUL students.

Table 0 Chi-Square Test of Relationship Between Technostress and Electronic Resource Utilization

Variable	calc	tab	df	Decision
Technostress & E-Resource Utilization	42.56	21.03	12	Reject H ₀

The Chi-square test in Table 0 reveals that the calculated value (= 42.56) is greater than the tabulated critical value (= 21.03) at 12 degrees of freedom. Consequently, the null hypothesis was rejected. This confirms a statistically significant relationship between technostress and electronic resource utilization among undergraduate students at FUL.

Data Presentation and Analysis

Research Question 1: What is the level of electronic information search competence among FUL students?

Table 1 Level of Electronic Information Search Competence

S/N	E-Resource	VH f (%)	H f (%)	L f (%)	VL f (%)	Mean	SD	Decision
1	Online Databases	120 (46.5)	90 (34.9)	30 (11.6)	18 (7.0)	3.21	0.89	High
2	E-books	95 (36.8)	85 (32.9)	50 (19.4)	28 (10.9)	2.96	0.98	High
3	E-journals	80 (31.0)	100 (38.8)	48 (18.6)	30 (11.6)	2.89	1.01	High
4	ETDs	70 (27.1)	90 (34.9)	60 (23.3)	38 (14.7)	2.74	1.08	High
5	OPAC	60 (23.3)	88 (34.1)	65 (25.2)	45 (17.4)	2.63	1.12	High
Grand Mean						2.89		High

Note. VH = Very High, H = High, L = Low, VL = Very Low. Decision benchmark = 2.50.

Data in Table 1 indicates that students possess a generally high level of competence in utilizing electronic resources (Grand Mean = 2.89), though proficiency varies significantly by platform. Students demonstrate the highest mastery of Online Databases (Mean = 3.21) and the lowest mastery of the OPAC (Mean = 2.63). The high competence in online databases agrees with Olorunfemi and Adekoya (2023), who noted that students easily transfer general web-search skills to commercial database interfaces. Conversely, the low proficiency in OPAC aligns with Isiakpona and Adebayo (2011), who found that Nigerian students struggle significantly with the structured search protocols and classification schemes required for specialized academic catalogues. The higher standard deviations observed in OPAC (1.12) further indicate a wide disparity in specialized skill levels among the student population.

Research Question 2: What are the major indicators of technostress prevalent among the FUL student body?

Table 2 Indicators of Technostress Prevalent Among FUL Students

S/N	Indicator	SA f (%)	A f (%)	D f (%)	SD f (%)	Mean	SD	Decision
1	Techno-overload	130 (50.4)	80 (31.0)	30 (11.6)	18 (7.0)	3.25	0.88	High
2	Techno-complexity	120 (46.5)	85 (32.9)	30 (11.6)	23 (8.9)	3.17	0.92	High
3	Techno-uncertainty	110 (42.6)	90 (34.9)	38 (14.7)	20 (7.8)	3.12	0.91	High
4	Techno-insecurity	100 (38.8)	95 (36.8)	40 (15.5)	23 (8.9)	3.05	0.95	High
5	Techno-isolation	85 (32.9)	90 (34.9)	50 (19.4)	33 (12.8)	2.88	1.03	High
Grand Mean						3.09		High

Note. SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree. Decision benchmark = 2.50.

Table 2 reveals that all measured technostress indicators are highly prevalent among the students (Grand Mean = 3.09). Techno-overload is the highest indicator (Mean = 3.25), corroborating the findings of Tarafdar et al. (2019), who established that the sheer volume of digital tasks and information fatigue is the primary driver of anxiety. Techno-isolation is the lowest-ranked indicator (Mean = 2.88). This finding disagrees with early corporate technostress models but strongly supports Zhao et al. (2023), who noted that in academic settings, technology is often used to facilitate peer collaboration, meaning the primary stressors are cognitive and operational rather than social.

Research Question 3: How do technostress indicators correlate with students' academic performance and engagement levels?

Table 3 Impact of Technostress on Academic Engagement and Performance

S/N	Impact	SA f (%)	A f (%)	D f (%)	SD f (%)	Mean	SD	Decision
1	Frustration with platforms	120 (46.5)	80 (31.0)	35 (13.6)	23 (8.9)	3.15	0.92	High
2	Reduced productivity	115 (44.6)	85 (32.9)	35 (13.6)	23 (8.9)	3.13	0.93	High
3	Decreased motivation	110 (42.6)	85 (32.9)	40 (15.5)	23 (8.9)	3.09	0.94	High
4	Increased errors	105 (40.7)	90 (34.9)	38 (14.7)	25 (9.7)	3.06	0.96	High
5	Avoidance of e-resources	100 (38.8)	95 (36.8)	40 (15.5)	23 (8.9)	3.05	0.95	High
Grand Mean						3.10		High

Note. SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree. Decision benchmark = 2.50.

Table 3 outlines the consequences of technostress on academic engagement. All items recorded means above the 2.50 benchmark, confirming that technostress severely impacts academic performance. Frustration with platforms is the highest impact (Mean = 3.15), which aligns with Schettino et al. (2022), who found that emotional responses to technical hurdles create a hostile learning environment. The lowest impact is the avoidance of e-resources (Mean = 3.05), though it remains significantly high. This avoidance behavior supports Mahapatra et al. (2023), who warned that technostress forces students to abandon digital tools entirely, thereby diminishing the quality of their research. Furthermore, the admission of increased errors (Mean = 3.06) agrees with Nastjuk et al. (2024) that psychological stress directly impairs cognitive accuracy.

Research Question 4: What strategies can be implemented to mitigate technostress?

Table 4 Strategies for Mitigating Technostress

S/N	Strategy	SA f (%)	A f (%)	D f (%)	SD f (%)	Mean	SD	Decision
1	Training & workshops	140 (54.3)	70 (27.1)	28 (10.9)	20 (7.8)	3.28	0.87	High
2	User-friendly systems	138 (53.5)	72 (27.9)	28 (10.9)	20 (7.8)	3.27	0.87	High
3	Technical support	135 (52.3)	75 (29.1)	28 (10.9)	20 (7.8)	3.26	0.88	High
4	Mental health support	125 (48.4)	80 (31.0)	30 (11.6)	23 (8.9)	3.19	0.91	High
5	Time management	120 (46.5)	85 (32.9)	30 (11.6)	23 (8.9)	3.15	0.92	High
Grand Mean						3.23		High

Note. SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree. Decision benchmark = 2.50.

Table 4 reveals a strong consensus on necessary institutional interventions. Training and workshops emerged as the highest-rated strategy (Mean = 3.28). This strongly supports Livingstone (2022), who emphasized that structured digital literacy training is the most effective weapon against techno-complexity. User-friendly systems ranked second (Mean = 3.27), corroborating Ragnedda (2019). Time management was the lowest strategy (Mean = 3.15), indicating that, unlike Upadhyaya and Vrinda (2021) who focused on individual coping, students in this context view technostress as a systemic issue requiring institutional intervention rather than personal adjustment.

Discussion of Findings

The analysis of data gathered from Federal University Lokoja (FUL) students reveals a complex interplay between digital competence, psychological stress, and academic efficiency. The study revealed a "digital literacy gap" where students demonstrated high competence in accessible tools like Online Databases but low competence in specialized infrastructure like the OPAC.

This finding is in agreement with Warschauer (2018), who argued that basic digital skills do not automatically translate to specialized information literacy.

Furthermore, the Chi-square analysis established a significant relationship between technostress and electronic resource utilization. The identification of techno-overload and techno-complexity as the highest indicators of technostress disagrees with the findings of La Torre et al. (2019), who positioned techno-insecurity as the primary stressor in professional environments. Instead, this finding aligns with Zhao et al. (2023), confirming that in academic contexts, the sheer volume of information and the difficulty of navigating unintuitive library systems are the primary inhibitors of effective research.

Regarding the impact on academic engagement, the data outlines a detrimental cycle where technical hurdles lead to frustration, which subsequently causes reduced productivity and avoidance of e-resources. This discovery is in strong agreement with Agogo and Hess (2018) and Mahapatra et al. (2023), who empirically validated that technology-induced anxiety forces students into avoidance behaviors, effectively wasting the university's investment in digital subscriptions. Finally, the students' strong preference for institutional interventions like training and system simplification over personal coping mechanisms supports the assertion by Ragnedda (2019) that bridging the digital divide requires systemic, top-down structural adjustments rather than relying solely on individual resilience.

Conclusion

This study concludes that technostress significantly influences the utilization of electronic resources among undergraduate students at the Federal University Lokoja. Although students demonstrated a generally high level of competence in using electronic resources, their proficiency was lower for specialized library tools such as the OPAC and ETDs. The findings identified techno-overload and techno-complexity as the predominant forms of technostress, which contribute to frustration, reduced productivity, decreased motivation, increased research errors, and avoidance

of electronic resources. The hypothesis test further confirmed a statistically significant relationship between technostress and electronic resource utilization, indicating that higher levels of technostress hinder effective access to and use of digital academic resources. The study therefore concludes that maximizing the benefits of electronic resources requires not only investment in digital infrastructure but also institutional efforts to strengthen students' digital competencies through continuous information literacy training, user-friendly library systems, responsive technical support, and digital wellness initiatives that minimize technology-related stress and enhance academic engagement.

Recommendations

Based on the findings and objectives of this study, the following recommendations are made:

1. To address the low competence in specialized tools: The university library should embed mandatory, specialized training on OPAC and ETD navigation into the undergraduate curriculum to bridge the digital literacy gap.
2. To address the high indicators of techno-overload and complexity: University IT and library departments should collaborate to simplify e-library interfaces, reducing unnecessary features that contribute to cognitive overload.
3. To address the negative impact on academic performance and engagement: The university should establish a dedicated, 24/7 technical helpdesk to immediately resolve platform frustrations, thereby preventing student avoidance of electronic resources and reducing research errors.
4. To implement effective mitigation strategies: Institutional management should integrate digital wellness and mental health support services into student orientation programs to help students cope with the psychological toll of techno-uncertainty and techno-insecurity.

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