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Technostress and Academic Self-Efficacy among Higher Education Students

Abhijeet Kumar*[1]
[1]Research Scholar, Department of Higher & Professional Education, National Institute of Educational Planning & Administration, New Delhi
*Corresponding Author: abhijeet@niepa.ac.in
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ABSTRACT
The growing use of digital technologies in higher education has both altered the teaching-learning process, and has also brought about new sources of academic stress. This paper evaluates the extent of technostress and academic self-efficacy among the students of higher education and discusses the association between the two constructs by differentiating across the chosen academic and demographic variables. A descriptive survey was used to gather data using 324 students whose data was obtained by using standardized scales of technostress and academic self-efficacy. Data was analyzed using descriptive and inferential statistical tests, which were correlation, t-test, and ANOVA. The findings showed that there was an average amount of technostress and high amount of academic self-efficacy among the students. There was a significant positive connection between the technostress and academic self-efficacy, which showed that the adaptive stress could be created by the manageable level of technological stress and boost the computer and internet students in relation to their academic assignments. The differences were significant in terms of the discipline, programme level, and locality but not in terms of gender. The findings highlight the contextual nature of technostress and underscore the importance of balanced technology integration and institutional support in fostering students' academic self-efficacy within digital learning environments.

Keywords: Technostress; Academic Self-Efficacy; Digital Learning; Student Well-being; Higher Education.

INTRODUCTION
The high digitalization of higher education has radically changed the way students interact in universities in terms of learning, research and communication on academic matters. The online assessments, learning management systems, online libraries and virtual collaboration tools have increased access to knowledge and learning flexibility. Nevertheless, in addition to the mentioned advantages, students constantly face the stress that is related to the constant usage of digital technologies, which is often defined as technostress. Technostress is defined as the mental pressure stemming out of inability to adapt, cope with or handle information and communication technologies (ICTs) in educational and work life (Brod, 1984; Tarafdar et al., 2011).

Meanwhile, academic self-efficacy, the idea of students to be able to excel at academic tasks successfully, is also an important factor in motivation, persistence and achievement in higher education (Bandura, 1997; Pintrich and De Groot, 1990). In learning systems mediated digitally, the youth are becoming more and more confidence in their ability to cope with their academic needs alongside their ability to cope with technological needs. Overload of information, being able to connect all the time, and the quick pace of digital platforms can destroy the sense of control and competence among students, thus influencing academic self-efficacy (Ayyagari et al., 2011; La Torre et al., 2019).

According to existing literature, there is dynamic relationship between technostress and academic self-efficacy. High technostress, especially the factors of techno overload and techno

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complexity, may decrease perceived academic competence and engagement in students on the one hand (Califf et al., 2020; Jena, 2015). Conversely, students whose academic self-efficacy is stronger can perceive technological problems as solvable, which would decrease the adverse effect of technostress (Joo et al., 2013). Due to the increased rate of digital infrastructure development in Indian higher education and more so after policy changes like SWAYAM and National digital library, there is need to empirically analyze the relationship between technostress and academic self-efficacy in university students.

It is against this background that the current research explores the content of technostress and academic self-efficacy among higher education students in the state of Bihar and their association with each other with regard to chosen demographic and academic variables. This relationship is the key to developing an institutional intervention that facilitates the psychological well-being of students and their academic achievement in technology intensive learning environments.

REVIEW OF LITERATURE

The review of literature is organized thematically in alignment with the objectives of the study.

Technostress in Higher Education

Technostress was first coined to narrate the impossibility of persons to effectively adjust to new computer technologies (Brod, 1984). Technostress in modern higher education has taken a multidimensional nature including techno overload, techno complexity, techno invasion, techno insecurity, and techno uncertainty (Ragu Nathan et al., 2008; Tarafdar et al., 2011). Techno overload means that technology may compel users in working more rapidly and with a great amount of information, whereas techno complexity indicates the inability to master and utilize complicated digital mechanisms.

Empirical research has shown that technostress among university students is the most common as a result of constant online interaction, the presence of numerous academic messages, and the necessity to use a variety of digital communication tools at the same time (Ayyagari et al., 2011; La Torre et al., 2019). These situations add to mental burnout, worry and lowered academic concentration especially within the setting of resource limited learning.

Academic Self-Efficacy and Student Outcomes

The academic self-efficacy is a fundamental aspect of the social cognitive theory and is closely linked to motivation, tenacity and academic success of students (Bandura, 1997). Students who have high self-efficacy tend to use effective learning styles, persevere in difficult tasks and also control their learning behaviors (Pintrich, 2000). On the other hand, continued exposure to failure or feeling of helplessness can also undermine self-efficacy beliefs and lower academic involvement.

Self-efficacy in technology mediated learning environment is not only subject based but also related to confidence in using digital tools. The challenges in accessing or using technology can thus be translated to wider concerns regarding academic competence particularly where the performance in technology can be directly related to assessment and evaluation.

Relationship between Technostress and Academic Self-Efficacy

An increasing amount of research indicates that there is a high degree of connection between technostress and academic self-efficacy. There have been reports of high techno overload and techno complexity associated with a decrease in perceived competence and growth in academic anxiety in students (Califf et al., 2020; Jena, 2015). In stress coping terms, students who evaluate technological demands to be greater than their coping resources tend to get stress and decrease in self-efficacy (Lazarus and Folkman, 1984).

Nonetheless, the correlation is not entirely negative. Even high self-efficacy students can perceive technological difficulties as mastery opportunities and thus they will experience manageable or even stimulating stress levels (Joo et al., 2013). This is an indication that academic self-efficacy may serve as both an aftermath of technostress and a collaborating factor that influences the way students think and react towards technological needs.

Moderating Role of Individual and Institutional Factors

Technological experience in the past, resilience, as well as positive attitudes towards technology are all individual factors that have a significant impact on the level of technostress (Tarafdar et al., 2019). Students that are more exposed to digital tools also report lower techno complexity and increased confidence in academic work. Motivating factors in the institution are also significant.

Technostress has also been alleviated through sufficient technical assistance and training and a positive learning environment that has been demonstrated to boost the academic self-efficacy of students (Ragu Nathan et al., 2008; Tarafdar et al., 2011). In spite of these revelations, empirical research that helps in the study of both technostress and academic self-efficacy and specifically in the Indian context of higher education is scarce. This gap highlights the necessity of context specific study based on demographic and academic factors including gender, locality, field of study, level of program and type of an institution.

RATIONALE FOR THE PRESENT STUDY

Introduction of ICT in Indian higher education has grown at a phenomenal pace transforming teaching learning processes, assessment practices, and research activities. As national projects assume to democratize the access to digital learning, the students are also expected to adjust to higher technological requirements. These requirements can create technostress, which influences the psychological well-being of students and their academic confidence in situations characterized by infrastructural inequalities and the digital literacy level.

Despite extensive literature on technostress, little has been done to determine the relationship between technostress and academic self-efficacy of higher education students in India, especially those in semi urban and rural areas. Since self-efficacy is a vital factor in academic achievement then it is necessary to know how technostress relates with self-efficacy in order to come up with effective policies and student support systems at the institution. The current research aims to fill this gap by investigating technostress and academic self-efficacy by systematically examining among the university students in Bihar.

OBJECTIVES OF THE STUDY

1. To examine the level of technostress among higher education students.
2. To assess the level of academic self-efficacy among higher education students.
3. To study the relationship between technostress and academic self-efficacy.
4. To analyze differences in technostress and academic self-efficacy with respect to gender, discipline, programme and locality.

HYPOTHESES OF THE STUDY

Based on the theoretical foundations of Social Cognitive Theory (Bandura, 1997) and the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984), the following hypotheses were formulated:

H1: There is a significant relationship between technostress and academic self-efficacy among higher education students.

H2: Technostress significantly differs across gender, discipline, programme level, and locality.

H3: Academic self-efficacy significantly differs across gender, discipline, programme level, and locality.

H4: Moderate levels of technostress are positively associated with academic self-efficacy, indicating a potential facilitative (eustress) effect.

METHODOLOGY

The research design used was descriptive survey to investigate the relationship that exists between technostress and academic self-efficacy of higher education students in Gaya district, Bihar. A total of 324 students who were selected through convenient sampling on a central university, a state university, and affiliated colleges were used as the sample. The dependent variables were technostress and academic self-efficacy, the independent variables were gender, discipline, programme and locality.

The adapted standardized tools were administered using an online questionnaire with prior consent. The data was analyzed by the descriptive statistics, correlation analysis, independent samples t tests, and one way ANOVA since parametric testing assumptions were met.

DATA ANALYSIS AND INTERPRETATION

The data collected were evaluated through descriptive and inferential statistics according to the mentioned objectives. Assumptions of normality were looked into before inferential analysis. The values of skewness and kurtosis of technostress (Sk = -0.26; Ku = -0.04) and academic self-efficacy (Sk = -0.98; Ku = 1.69) were within the acceptable range, which supports the use of parametric statistical methods.

Table 1: Descriptive Statistics of Technostress (N = 324)

Dimension	Mean	SD	Skewness	Kurtosis
Techno-Overload	15.80	2.77	−0.20	−0.36
Techno-Invasion	9.04	1.71	−0.10	−0.19
Techno-Complexity	12.70	3.25	−0.09	−0.22
Overall Technostress	37.53	5.96	−0.26	−0.04

Result: Descriptive analysis revealed an average level of technostress on higher education students (M = 37.53, SD = 5.96), techno-overload had the greatest role, then techno-complexity and techno-invasion. The score distributions indicated that the students could manage the demands of the digital environment, but constant exposure to technology presented academic functioning with perceivable stress.

Table 2: Descriptive Statistics of Academic Self-Efficacy (N = 324)

Variable	Mean	SD	Skewness	Kurtosis
Academic Self-Efficacy	72.38	12.56	−0.98	1.69

Result: The results also showed that academic self-efficacy of students was high (M = 72.38, SD = 12.56). This shows that, in spite of technological difficulties, students were more or less confident in their academic skills which implies adaptive coping and resilience in the setting of digital learning.

Table 3: Correlation between Technostress and Academic Self-Efficacy

Variables	r	p-value	Result
Technostress × Academic Self-Efficacy	.32	< .01	Significant

Result: The findings revealed a moderate positive correlation ($r = .32$, $p < .01$) between technostress and academic self-efficacy. While this suggests a statistically significant association, the interpretation requires caution. Rather than implying a direct beneficial effect of technostress, the result may indicate that students who are more engaged with digital

academic environments simultaneously experience higher technological demands and develop stronger efficacy beliefs**.**

This aligns with the challenge–hindrance stressor framework, where certain stressors—when perceived as manageable—may function as challenge stressors, promoting growth and competence. However, the cross-sectional nature of the data limits causal inference

Table 4: Gender-wise Comparison of Technostress and Academic Self-Efficacy

Variable	Gender	Mean	SD	t-value	Result
Technostress	Male	37.04	6.19	−1.63	Not Significant
	Female	38.13	5.62		
Academic Self-Efficacy	Male	71.80	13.39	−0.92	No Significant
	Female	73.10	11.48		

Result: Technostress and academic self-efficacy are not considerably affected by gender among students.

Table 5: ANOVA Results for Technostress across Discipline, Programme, and Locality

Variable	Factor	F-value	p-value	Result
Technostress	Discipline	2.48	< .05	Significant
	Programme	7.30	< .01	Significant
	Locality	6.74	< .01	Significant

Result: The ANOVA findings showed that technostress is not the same across discipline, programme level and locality. It implies that academic discipline, level of programme, and locality background have a significant impact on influencing the experience of technological stress among higher education students.

Table 6: ANOVA Results for Academic Self-Efficacy across Discipline, Programme, and Locality

Variable	Factor	F-value	p-value	Result
Academic Self-Efficacy	Discipline	6.39	< .01	Significant
	Programme	5.60	< .01	Significant
	Locality	6.71	< .01	Significant

Result: The results demonstrate statistically significant variations in self-efficacy in academic performance depending on the discipline, level of programme and locality, meaning that the differences in academic exposure, institutional setting, and learning environment can affect the confidence of the students in their academic performance.

RESULTS AND DISCUSSION

The present study aimed to examine technostress and academic self-efficacy and their interrelationship within digitally mediated higher education contexts.

The findings indicate a moderate level of technostress, with techno-overload emerging as the dominant dimension. This supports prior research suggesting that continuous connectivity and information demands contribute to cognitive strain. However, rather than interpreting this solely as detrimental, the findings suggest that students may be adapting to persistent technological demands, reflecting evolving digital competencies.

At the same time, high academic self-efficacy among students suggests a strong belief in their academic capabilities. From a social cognitive perspective, this may reflect accumulated mastery experiences and successful adaptation to digital learning environments.

Importantly, the positive association between technostress and self-efficacy should not be interpreted as evidence that stress is inherently beneficial; rather, this relationship may reflect increased exposure to academic technologies, which simultaneously imposes greater demands

while enhancing competence, or it may indicate that students with higher self-efficacy are more inclined to engage with challenging technological tasks, thereby reporting higher levels of technostress.

This interpretation aligns with the transactional framework of stress, wherein outcomes depend on individuals' cognitive appraisal and available coping resources (Richard S. Lazarus & Susan Folkman, 1984), suggesting that technostress may function as eustress only under conditions of adequate support and coping capacity.

The absence of gender differences suggests that digital academic demands are relatively uniform across male and female students, possibly due to similar access and expectations in higher education settings.

In contrast, significant differences across discipline, programme level, and locality highlight the contextual nature of both technostress and self-efficacy, as these variations may be attributed to differential technological exposure and curriculum demands, variations in institutional infrastructure and levels of digital literacy, as well as unequal access to support systems, particularly between rural and urban contexts. These findings reinforce the importance of context-sensitive educational policies, rather than generalized assumptions about student experiences.

CONCLUSION

Technology has become a part of higher education, one which has great impact on the academic practices and psychological involvement of the students in the learning process. The presence of moderate technostress and high academic self-efficacy is indicative of the ability of the students to adjust to technology-intensive academic settings. Although the pressures associated with academic technologies are connected with workload, complexity, and constant connectivity, students are to a great extent confident in their skills in coping with academic tasks. The positive correlation between technostress and academic self-efficacy demonstrates that the demands associated with technology when applied at manageable levels can be adaptive stress and stimulate the development of skills, finding solutions and academic competence. Findings of variation in technostress and academic self-efficacy among disciplines, programme levels, and localities point to the role played by academic context, institutional infrastructure, and learning environments on the technological experiences of students and their levels of confidence. Concurrently, the lack of gender differences indicates that there is no significant difference in exposure and the use of academic technologies by both male and female students. All in all, successful and sustainable integration of technology in higher education must be institutionalized through the institutional mechanisms that enhance digital capabilities, offer sufficient academic and technological support, and alleviate too much technological overload. This kind of strategy can help to make sure that technology serves as an aid to learning and academic self-efficacy, as opposed to being a cause of ongoing academic stress and, as such, help to improve academic performance and student health.

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