



RELATIONSHIP BETWEEN ONLINE-LEARNING SELF-EFFICACY AND ACADEMIC STRESS OF ENGINEERING STUDENTS

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Abstract: During COVID 19 pandemic online teaching aggravated the academic stress of students. Self-efficacy helps an individual to perceive threats imposed by an environment as challenges and perform better. The aim of the study was to find out the relationship between academic stress and online learning self-efficacy of engineering students. The sample of the study comprised 275 engineering students. Spearman's correlation method was used to analyze data. The results showed no correlation between academic stress and online learning self-efficacy. The study concluded that academic stress and online learning self-efficacy are independent aspects of students' lives.

Index Terms - Online learning Self-efficacy, Academic stress, Engineering students.

I. INTRODUCTION

The paradigm shift from face-to-face teaching to online happened during the COVID-19 pandemic. Online education has proved beneficial during lockdown due to its flexibility in schedule and being cost-effective as no commutation was required for students. (Amir et al., 2020) "Online learning is referred to as learning with the help of Information and Communication Technologies (ICTs)". Some students believe that this sudden change in the education system which was unplanned and without training will lead to poor and unproductive career growth while others think that this new model of learning will give some significant benefits. The benefits of this new model of education depend upon the perceptions of the students of their abilities. Continuous online classes lead to boredom and low motivation among students bringing about procrastination and reduced punctuality. It also caused physical strain and fatigue. Practical knowledge is usually acquired through lab work, which could not be given through online classes. Decreasing students' hands-on experience in their subjects reduced their on-field confidence. The pattern of examinations changed due to online learning, vast curriculum, and, worrying about the future may have aggravated the level of academic stress among students.

According to Abid et al. (2021) "Academic stress arises when academic-related demands exceed those available resources an individual possesses". Academic stress is an emotional or mental state which is commonly experienced by students during studies. There can be different factors leading to stress such as exam pressure, challenging coursework, and future plans after graduation. Additionally, parental expectations, the attitude of teachers toward teaching and students, teaching styles, student and teacher relationships, and lack of knowledge of pedagogy contribute to increasing academic stress. During the pandemic, online learning has negatively affected the students academically. Not every student has his/her personal laptop or computer and many of them share these devices with their parents or siblings. Every student may not have access to a strong internet connection and was not able to attend online classes properly. Therefore, online learning has become stressful for some students. When an individual has belief in his/her abilities he/she can deal with any kind of stress effectively. As per the cognitive model of stress (Lazarus and Folkman, 1984), self-efficacy benefits to evaluate the demands of the environment. An individual with high self-efficacy perceives threats imposed by an environment as challenges. Hence, self-efficacy is the extent to which a person is confident about his/her abilities to handle a stressful situation as a challenge.

The idea of self-efficacy was introduced by Albert Bandura. (Bandura, 1994) Self-efficacy is a set of beliefs that determine capabilities to produce specified performance. "Online learning self-efficacy refers to an individual's perception of his/her ability to successfully complete specific tasks required of online learners" (Zimmerman and Kulikowich, 2016). (Horzum and Çakir, 2009) Self-efficacy is connected with one's confidence to accomplish something. It is the ability of an individual to control his/her emotions, thoughts, and behavior. It directly affects the performance of that individual. In the field of education, it is related to efforts, persistence, and success. Students with high self-efficacy are good at self-regulation and dealing with obstacles (Bandura, 2001). Self-efficacy is the belief of students to interpret the difficult situation as manageable and use their potential efficiently. Self-efficacy is perceived negatively or positively according to different situations. In the case of online learning or the use of technology for learning, the familiarity and comfort of an individual influence his/her self-efficacy.

Therefore, it was essential to compare the relative importance of online learning self-efficacy and academic stress.

II. LITERATURE SURVEY

Online learning played an important role in the education system during the COVID-19 pandemic. It is accessible and flexible for both learners and educators. However, learning in isolation and continuous tutoring led to stress among students. Students are uncertain about their academic achievement through online learning and experience stress while coping with new pedagogy.

Chandra (2021) studied 94 undergraduates and postgraduates from different management schools in India. She has further mentioned that those who were bright and scholarly students did not get an opportunity of scoring better grades by showcasing their knowledge. Some students had taken up some other online courses to add to their technical skills. The researcher found that scoring better grades for the best job, to meet the expectations of parents and teachers leads to academic stress. Additionally, low physical activity and spending time at home aggravate stress during the pandemic.

During the survey, Asgari et al. (2021) found several logistical challenges faced by engineering students. Some students complained about Zoom fatigue due to attending back-to-back online sessions, while other students mentioned the problem of social disconnection from their peers. Many students mentioned about lack of guidance from their instructor. Some had problems with time management during an online exam. The online education system caused the major educational loss, not getting chances for internships, and fewer job offers.

While studying undergraduates Deshpande and Mhatre (2021) studied students from project-affected families. They found that due to financial constraints many students were not able to get better digital devices and sufficient internet facilities needed for online learning. This led to the avoidance of attending online lectures. Also, attending lectures for 3-4 hours constantly, affected the level of concentration of the students. They were not able to complete their assignments on time. Many students could not understand online lectures which lead to stress and anxiety.

Shen et al. (2013) reported that online learning self-efficacy comprises five main factors: self-efficacy to complete an online course, self-efficacy to interact socially with classmates, self-efficacy to use a course management system, self-efficacy to interact with instructors, and self-efficacy to interact with classmates for academic purposes. Researchers also mentioned that those who have more personal experiences with online learning tend to show high self-efficacy.

Horzum and Cakir (2009) stated that the perception of self-efficacy in academics is related to the efforts, persistence, and achievement of students. Therefore, it is directly related to the success and performance of online education. According to Hodges (2008), Self-efficacy beliefs change according to the situation as they are context-specific. Changes in the modes of learning or education may affect students' self-efficacy. So, self-efficacy is important for students in a challenging online learning environment where they do not get chances to interact with teachers and peers directly and feel socially isolated.

In the context of the above points, the present study attempts to examine the relationship between online-learning self-efficacy and the academic stress of college students.

III. THE OBJECTIVE OF THE STUDY

For the last two years, students are away from physical campuses and taking education through online methods. They were forced to finish their semesters via remote learning, due to which, their academic life has become more stressful. To achieve their career goals, they need to believe in their abilities. Self-efficacy in the context of online education is important to perform tasks confidently. It is the extent to which an individual believes in his abilities to accomplish tasks and select effective coping strategies during stress. Therefore, the present study aims to measure the correlation between Online-Learning Self-efficacy and Academic Stress among engineering students.

IV. METHODOLOGY

4.1 Operational Definitions of variables

Online learning self-efficacy was operationally defined with the help of an online learning environment, time management, and the use of technology. (Zimmerman and Kulikowich, 2016).

Perception of Academic Stress can be operationalized on the basis of pressures to perform, perceptions of workload, academic self-perceptions, and time restraints (Bedewy and Gabriel, 2015).

4.2 Population and Sample

Table 4.1 Gender wise distribution of data

Gender	Frequency	Percent
Male	206	74.9
Female	68	24.7
Not prefer to say	1	.4
Total	275	100.0

Table 4.2 Educational Level wise distribution of data

Educational Level	Frequency	Percent
Undergraduate	268	97.5
Graduate	7	2.5
Total	275	100.0

Students from engineering colleges of Pune city in Maharashtra were selected with a random sampling method. Participants were between the age group of 18-22 years among which 206 were males and 68 were females and one participant did not prefer to mention gender (table 4.1). The sample consisted of 268 undergraduate students and 7 graduate students (table 4.2).

4.3 Tools

Perception of Academic Stress Scale: PAS is an 18-item scale ranging from strongly agree to strongly disagree. It consists of four factors: Pressure to perform (0.6), Perception of workload and examinations (0.6), Self-perceptions (0.5), and Time restraints (0.6) with overall internal consistency reliability of (0.7) Cronbach's alpha (Bedewy and Gabriel, 2015). The reliability of the scale on the current sample was found .742 Cronbach alpha.

Online Learning Self-Efficacy Scale (Zimmerman and Kulikowich, 2016): The scale consists of 22 items ranging from completely disagree to completely agree. The scale has 3 subscales; the 10 items for the Online learning environment (.890), 5 items for Time management (.855), and 7 items for technology use (.843) Cronbach's alpha (Yavuzalp and Bahcivan, 2020). The reliability of the scale on the current sample was found .857 Cronbach alpha.

4.4 Procedure

Data was collected with Google forms sent via emails and social networking sites. The purpose of the research was explained and confidentiality about the responses was assured to the participants.

4.5 Statistical Analysis

Statistical analysis was carried out by SPSS 20.0 software. The score of online self-efficacy was not normal distributed. Nonparametric Spearman's rho was implemented to examine the correlation between academic stress and online learning self-efficacy.

V. RESULTS AND DISCUSSION

Table 5.1 Descriptive Statistics

	Mean	Std. Error	Std. Deviation	Skewness	Kurtosis	
Academic stress	53.15	.498	8.254	-.210	2.945	Academic stress
Online learning Self-efficacy						Online learning Self-efficacy
	80.21	.618	10.247	-1.291	7.466	
	Mean	Std. Error	Std. Deviation	Skewness	Kurtosis	
Academic stress	53.15	.498	8.254	-.210	2.945	Academic stress

Table 5.2 Correlation between Academic Stress and Online learning Self-efficacy

			Academic Stress	Online learning Self-efficacy
Spearman's rho	Academic Stress	Correlation Coefficient	1.000	.037
		Sig	.	.543
		N	275	275
	Online learning Self-efficacy	Correlation Coefficient	.037	1.000
		Sig.	.543	.
		N	275	275

The result of the study with respect to the relationship between academic stress and online learning self-efficacy was not found statistically significant ($r = 0.037$). A zero correlation between academic stress and online learning self-efficacy was observed. This indicates that the two variables are independent aspects of students' lives. There are several reasons that academic stress and online learning self-efficacy can be independent of each other.

The academic stressors for engineering college can be different from online classes. Lectures are just a part of their skill development or subject knowledge. For engineering college students, academic stresses can be completing assignments, preparing presentations, being innovative in practical work, trying to get outstanding scores in examinations and the list may continue. (Manea et al., 2020) During a pandemic, distance learning was a frustrating and stressful experience for students. Lack of face-to-face communication, lack of socialization, and interaction with teachers and friends made online learning stressful and boring.

On the other hand, online learning could have been a much easier job for the students confident about online tasks. It was noticed that engineering college students had been using online technology even before the pandemic. They already had a strong social network that was been used for academic purposes even before the covid outbreak. The comfort with online learning methods may have resulted in higher online self-efficacy (Ulfatun et al., 2021). Tanius et al (2020) have found that students have high self-efficacy in online learning technology, though they are using it for the first time and for a longer period. The scores of the study sample on online teaching self-efficacy are kurtosis indicating the higher mean score.

The interactions with the participants gave valuable input to the researcher regarding the reason for high online learning self-efficacy. Many participants mentioned that before starting online classes, orientation programs were conducted by their colleges. To give practice in such an environment, training programs were arranged online and students were provided vicarious experiences through feedback from the faculties. Assignments and projects were given with the use of scaffolding. All these strategies helped students to gain high self-efficacy in online learning.

VI. CONCLUSION

University stress is common for all students but it is more prevalent among engineering students. COVID 19 has made students stay away from their schools and colleges. They miss campus life and friends. Many universities and schools have postponed exams, others have canceled them. Schools and colleges have used different methods to assess students' academic performance. Some students benefited from this situation but many deserving students missed their opportunity to score better grades in exams. This aggravated academic stress among engineering students. Due to knowledge of technology, the majority of the students know how to use technology to improve their performance. Students with high self-efficacy know how to deal with problems. The study was conducted to find out the relationship between academic stress and online learning self-efficacy of engineering students. The results of the study found no relationship between these two variables.

VII. IMPLICATIONS OF THE STUDY

Engineering students face main competition in the labor market after their graduation. Online learning is popular on many college campuses in different countries. In India, the online learning education system is yet to develop. The findings of the study help to gain knowledge of the use of online classes and different programs. Attention must be paid to the documentation of the literature and the hurdles faced by the students during online learning in India must not be overlooked. Even after the pandemic, students will continue to enroll in different online programs and universities must plan to increase their efficiency in providing online education. The results of this study provide evidence that for online learning students need more awareness of what they have done before, during, and after online classes. Regular and positive feedback provided during online classes facilitates students learning in online environments. Considering the results of the study, research on distance education can also be included in regular study design. Online learning self-efficacy is important for the innovativeness of the students. Though results show no relationship between academic stress and online learning, implementing some awareness programs to understand the adverse effects of academic stress and the importance of self-efficacy is necessary for engineering students.

VIII. SCOPE OF THE FUTURE RESEARCH

The present study's sample showed limited diversity in terms of gender and year of enrolment and degree type. The future study should consider variables such as students' academic performance, socioeconomic status, and parental involvement. These may be relevant to the stress management and self-efficacy of students. The study was conducted in limited universities located in one city. To generalize the results, new studies need to involve students from other geographical areas. Another limitation is the data was collected with self-report measures. Response bias may have occurred due to social desirability. Future studies should use a combination of questionnaires and interviews of students.

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REFERENCES

- [1] Abid, A., Farhan, S. and Atif, T. (2021). Academic Stress, Psychological Distress, Coping and Self-Efficacy among Undergraduate University Students during COVID 19. *Asian Journal of Social Sciences and Management Studies*, 8(2): 43-52.
- [2] Basu, S. 1997. The Investment Performance of Common Stocks in Relation to their Price to Earnings Ratio: A Test of the Efficient Markets Hypothesis. *Journal of Finance*, 33(3): 663-682.
- [3] Bandura, A. (1994). Self-efficacy. In V. S. Ramachandran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).
- [4] Bandura, A. (2001). SOCIAL COGNITIVE THEORY: An Agentic Perspective. *Annual Review of Psychology*, 52: 1-26.
- [5] Bedewy, D. and Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: The Perception of Academic Stress Scale. *Health Psychology Open*, pp. 1–9. DOI: 10.1177/2055102915596714
- [6] Chandra, Y. (2020). Online education during COVID-19: perception of academic stress and emotional intelligence coping strategies among college students. *Asian Education and Development Studies*, 10 (2): pp. 229-238. DOI 10.1108/AEDS-05-2020-0097
- [7] Hodges, C. B. (2008). Self-efficacy in the context of online learning environments: A review of the literature and directions for research. *Performance Improvement Quarterly*, 20(3-4): 7–25. doi:10.1002/piq.20001
- [8] Horzum, M. B. and Cakir, O. (2009). The Validity and Reliability Study Of The Turkish Version Of Online Technologies Self-Efficacy Scale. *Educational Sciences: Theory and Practice*, 9(3): pp. 1343-1356
- [9] Lazarus, R. S. and Folkman, S. (1984). Stress, Appraisal and Coping. *Encyclopedia of Behavioral Medicine*, 1913–1915. doi:10.1007/978-1-4419-1005-9_215
- [10] Manea, V. I., Macavei, T. and Pribeanu, C. (2020). Stress, frustration, boredom, and fatigue in online engineering education during the pandemic. *International Journal of User-System Interaction*, 13(4): pp. 199-214.
- [11] Moazami, F., Bahrapour, E., Azar, M. R., Jahedi, F. and Moattari, M. (2014). Comparing two methods of education (virtual versus traditional) on learning of Iranian dental students: a post-test only design study. *BMC Medical Education*, 14(5): 1-5.
- [12] Shen, D., Cho, M., Tsai, C. and Marra, R. (2013). Unpacking online learning experiences: Online learning self-efficacy and learning satisfaction. *Internet and Higher Education* 19, 10–17.
- [13] Tanius, E., Aqila Alwani, N. I. and Muei, S. A. (2020). University Students' Self-efficacy in Online Learning Due to COVID-19. *International Journal of Innovative Research in Engineering & Multidisciplinary Physical Sciences*, 8(6): 107-113.
- [14] Ulfatun, T., Septiyanti, F. and Lesmana, A. G. (2021). University Students' Online Learning Self-efficacy and Self-regulated Learning during the COVID-19 Pandemic. *International Journal of Information and Education Technology*, 11(12): 597-602.

- [15] Yavuzalp, N. and Bahcivan, E. (2020). The Online Learning Self-Efficacy Scale: Its Adaptation Into Turkish And Interpretation According To Various Variables. Turkish Online Journal of Distance Education, 21(1): 31-44.
- [16] Zimmerman, W. A. and Kulikowich, J. M. (2016) Online Learning Self-Efficacy in Students With and Without Online Learning Experience, American Journal of Distance Education, 30(3): 180-191, DOI: 10.1080/08923647.2016.1193801

