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To cite this article:

Fayda-Kinik, F. S. (2023). Academic stress in online higher education. *International Journal of Technology in Education and Science (IJTES)*, 7(1), 18-29. <https://doi.org/10.46328/ijtes.439>

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Article Info

Article History

Received:

13 July 2022

Accepted:

05 December 2022

Keywords

Academic stress

University students

Higher education

Online learning environment

Abstract

With the unprecedented impacts of the COVID-19 outbreak, higher education institutions have faced a number of challenges, one of which is the transition to online education. University students have experienced varying levels of stress as the largest group affected by this transition. The perceived level of academic stress experienced by university students in this new system has become significant for the improvement in online learning at the tertiary level. Therefore, this study aimed to measure the level of academic stress among university students including the components of pressures to perform, perceptions of workload, academic self-perceptions, and time restraints during online learning. In order to measure the level of academic stress among university students, a quantitative research design was adopted through gathering statistical data from 147 undergraduate students studying online in different departments in Turkey utilizing "The Perception of Academic Stress Scale" including the components of pressures to perform, perceptions of workload, academic self-perceptions, and time restraints during online learning. The results of this quantitatively designed study revealed that the perceived level of academic stress among university students was found as neutral in general; regarding the components of "Pressures to Perform" as high, of "Perceptions of Workload", "Academic Self-Perceptions" and "Time Restraints" as neutral. Some statistically significant differences were also detected in the perceived level of academic stress in relation to the variables of gender, age (Gen X vs Gen Y), year of study, satisfaction with the learning and home environments.

Introduction

The COVID-19 pandemic has caused an unexpected transition to online education in higher education institutions (HEIs). Such a change has led to an increase in the level of stress for undergraduate students because the learning environment and conditions of students have substantially changed demanding relatively differentially-required tasks. Lazarus and Folkman (1984) described stress as "the relationship between the person and the environment" emphasizing both "the characteristics of the person" and "the nature of the environment" (p. 21). Lazarus and Cohen (1977) elaborated on the concept of stress as "the environmental demands that require major adaptive responses from the individual" (p. 90). With this definition, it is signified that stress is described as the relationship or transaction between the person and the environment. In this respect, it is obvious that the learning environment is dramatically reconstructed with an online mode, which causes different reactions depending on the characteristics of students in HEIs.

Syle (1974) defined stress as “the non-specific response of the body to any demand made upon it” indicating the term “stressor” which purports as “the stress-producing factors” (p. 27). Stressors that students encounter can be categorized into two types: Internal stressors “generated within the body” and external stressors “generated outside the body”, both of which include physical and psychological sub-types (Camargo et al., 2021, p. 4). In addition to the pandemic conditions, university students, as adolescents entering the period of adulthood, experience stress because of the new expectations and pressures during their study life (Cheng, 1999; Liu, 2001). Kumaraswamy (2013) alleged that a large number of assignments, peer competitions, exams, and problems with time management increase academic stress. Depending on the stressors such as studies, university and lecturers, grades and competition, work, career and future (Cherian & Cherian, 1998; Lee et al., 2005), university students face stress internally and/or externally resulting from physical and psychological factors.

Regarding the educational change in HEIs due to the pandemic, the transition to online education triggers stress occurrence among students resulting in poor performance. Therefore, academic stress among students has become a central role hindering the effectiveness of online education. Gupta (2020) described academic stress as “a term associated with the ineffective and unhealthy reaction to the demands of the changes in the task and process of learning” (p. 558). Lal (2014) defined academic stress as the mental distress linked with some expected frustrations such as academic failure or unawareness of the possibility of such failure. As obviously indicated by Gupta (2020) and Lal (2014), academic stress comes along with stressors in the context of learning, which results in the occurrence of the fear of failure among students.

Academic stress is considered a critical factor affecting success in HEIs (Guo et al., 2011; Pritchard & Wilson, 2003). You (2018) notably stated that academic stress leads to both positive and negative consequences. Syle (1974) expressed that the production of a considerable level of stress may not cause harmful effects. In furtherance, a moderate level of academic stress can be a driving force for students to succeed (You, 2018; Zajacova et al., 2005). However, academic stress also brings about negative effects on students’ learning by deteriorating students’ psychological and mental health, and well-being (MacGeorge et al., 2005) and impairing academic performance (Lumley & Provenzano, 2003; Pritchard & Wilson, 2003; Sohail, 2013; Struthers et al., 2000).

Online learning environments could be a stressor for an increase in the university students’ level of academic stress because of the lack of ability to perform successfully in this new system (Clabaugh et al., 2021) and the challenging conditions resulting from the learning and home environment (Son et al., 2020). Prior research on academic stress in online learning at the tertiary level is quite limited but significant to improve the deficiencies in the online learning environment for university students. In a study conducted by Moawad (2020) aiming to investigate academic stress among university students during the COVID-19 pandemic, six stressors were identified as exams, assignments, lecture time, home settings, internet, and uncertainty among the students during online education. Heo and Han (2018), in their study aiming to determine the predictors for the readiness of self-directed learning among online university students in Korea, revealed that academic stress is an influential factor for the level of self-directed learning readiness and recommended a variety of educational strategies to reduce academic stress that online learning students encounter during their classes. Clabaugh et al. (2021) detected a high level of uncertainty among 295 college students in the U.S. because of the pandemic conditions by reporting the

risk for academic stress.

Attempts are required to take to improve the quality of online learning environments in the post-pandemic period. Therefore, this study aimed to measure the level of academic stress among university students including the components of pressures to perform, perceptions of workload, academic self-perceptions, and time restraints in online learning environments. The results of the study contribute to the existing literature on academic stress among university students taking online courses by providing implications to improve online learning systems for lecturers, practitioners, and educational administrators.

Methodology

In order to measure the level of academic stress among university students, a quantitative research design was adopted by gathering statistical data from undergraduate students utilizing “The Perception of Academic Stress Scale” (Bedewy & Gabriel, 2015) including the sub-dimensions of pressures to perform, perceptions of workload, academic self-perceptions, and time restraints during online learning. The research questions investigated in the study are listed below:

RQ1: What is the level of academic stress among university students during online learning?

RQ1.1: What is the level of pressures to perform among university students during online learning?

RQ1.2: What is the level of perceptions of workload among university students during online learning?

RQ1.3: What is the level of academic self-perceptions among university students during online learning?

RQ1.4: What is the level of time restraints among university students during online learning?

RQ2: Does academic stress among university students differ by demographic variables?

RQ2.1: Does academic stress among university students differ by gender?

RQ2.2: Does academic stress among university students differ by age?

RQ2.3: Does academic stress among university students differ by year?

RQ2.4: Does academic stress among university students differ by learning environment?

RQ2.5: Does academic stress among university students differ by home environment?

Sample

As a non-probability sampling method, convenience sampling was used to determine the study group of the present research. The participants of the study were selected from undergraduate students taking online courses in Turkey in the 2020-2021 academic year. 147 students volunteered to be included in the study, 61.2% of whom were women and 38.8% were men. The majority of participants (89.8%) represented Gen Z, whereas 10.2% of them belonged to Gen Y. Regarding the year they were studying during the research, 68.7% of the participants were in the first year, 10.9% in the second year, 9.5% in the third year, 6.8% in the fourth year and 4.1% in their fifth year.

In respect of satisfaction with the learning environment, 4.8% of the participants stated that they were not satisfied with the learning environment, and 29.9% of them were not very satisfied. The rate of those who indicated that they were satisfied with the learning environment was 55.1%, while the rate of those stating that they were very satisfied was found 10.2%. Finally, the percentage of the participants who stated that they were not satisfied with the home environment was 12.2%, the rate of those who stated that they were not very satisfied was 25.2%, the rate of those who stated that they were satisfied was 47.6%, and the rate of those who stated that they were very satisfied was 15%.

Research Instrument

The questionnaire used in the study has two parts: Demographics and Academic Stress Scale. In the first part, demographic information was requested from the sample. The participants were asked about their gender, age, year of study, satisfaction with the learning environment, and satisfaction with the home environment.

The second part of the research instrument consists of the items to measure the level of academic stress. Therefore, the participants involved in the study filled in "The Perception of Academic Stress Scale" consisting of 18 items developed by Bedewy and Gabriel (2015) specifically for university students with a five-item Likert-type scale ("Strongly disagree", "Disagree", "Neutral", "Agree", "Strongly agree"). Concerning the reliability of the scale, the coefficient of Cronbach's Alpha was calculated as 0.72, which is acceptable (George & Mallery, 2003). The scale is comprised of four sub-dimensions; namely, "pressures to perform" measured with items 6, 8, 13, 14, and 17, "perceptions of workload" with items 10, 11, 15, and 18, "academic self-perceptions" with items 1, 2, 3, and 7, and "time restraints" with items 4, 5, 9, 12, and 16.

Data Collection

Before the study was conducted, the permission for scientific and academic compliance was received from the Board of Ethics affiliated with the institution of the researcher. The questionnaire with its two sections was configured on an online platform to be shared as a link with the study universe. Participation in the study was on a voluntary basis. Therefore, the details on the aim and scope of the research were provided in alignment with the consent form. Of more than 250 deliveries to the prospective sample, 147 valid responses were collected from different departments of different universities in Turkey to be analyzed in this study.

Data Analysis

The collected data was organized in EXCEL in a coded version and examined in regard to each component of the questionnaire. After the data clearance procedures were applied to eliminate the invalid/missing responses, the valid responses were determined to be analyzed. In parallel with the research questions, the data was analyzed using parametric tests via SPSS for Windows v26.0 software. First, descriptive analyses were carried out to identify the level of academic stress with its four sub-dimensions of "pressures to perform", "perceptions of workload", "academic self-perceptions", and "time restraints" to investigate RQ1. Second, whether the level of

academic stress differs by demographic variables was investigated for RQ2. Accordingly, independent samples t-test for the demographic variables with two options was performed for RQ2.1 and RQ2.2, and the one-way ANOVA for the demographic variables with multiple options was carried out for RQ2.3, RQ2.4, and RQ2.5. Finally, Tukey analysis was also used in order to determine the source of the difference between the groups that were determined as a result of the one-way ANOVA.

Results

According to the results of the analyses, the findings were reported in two parts: “academic stress among university students” (RQ1) and “academic stress by demographic variables” (RQ2).

Academic Stress Among University Students

To identify the level of academic stress among university students during online learning (RQ1), the results of descriptive analyses carried out by employing SPSS for Windows v26.0 software are presented in Table 1.

Table 1. Results of Descriptive Statistics

	$\bar{X} \pm SS$	Skewness	Kurtosis
Academic Stress	3.1844±0.48830	0.016	1.750
Pressures to perform	3.5211±0.65231	-0.926	2.476
Perceptions of workload	3.2466±0.81562	-0.720	0.859
Academic self-perceptions	2.8469±0.71520	0.922	1.754
Time restraints	3.0340±0.57386	0.513	1.832

As depicted in Table 1, students' overall levels of academic stress and stress levels for the sub-dimensions of “perceptions of workload”, “academic self-perceptions”, and “time restraints” were identified as neutral ($2.60 < \bar{X} < 3.40$). On the other hand, the stress level for the sub-dimension of “pressures to perform” was found high ($\bar{X} > 3.40$).

Academic Stress by Demographic Variables

As a response to RQ2, the results obtained after the analyses of the findings through independent samples t-test and the one-way ANOVA are shown in order of gender, age, year of study, learning and home environments. First, independent samples t-test was used to determine whether the levels of academic stress of the participants varied according to their gender as demonstrated in Table 2. As indicated in Table 2, the findings of the independent samples t-test results show that the level of academic stress with its sub-dimensions does not significantly differ according to gender.

Second, independent samples t-test was performed to determine whether the levels of academic stress of the participants varied by their ages. The participants aged between 18 and 24 were represented as Gen Z whereas the

ones aged between 25 and 40 stood for Gen Y as indicated in Table 3.

Table 2. Academic Stress by Gender

Academic Stress	Female (n=90)	Male (n=57)	t (p)
Pressures to perform	3.4689±0.61162	3.6035±0.70962	-1.221 (0.224)
Perceptions of workload	3.1694±0.77968	3.3684±0.86229	-1.447 (0.150)
Academic self-perceptions	2.7750±0.64700	2.9605±0.80427	-1.467 (0.146)
Time restraints	3.0833±0.50974	2.9561±0.65996	1.313 (0.191)

Table 3 illustrates the findings of the independent samples t-test results for the age variable. Accordingly, it is proven that the stress levels of Gen Y (aged between 25-40) related to the "academic self-perceptions" dimension were detected as higher than those of Gen Z (aged between 18-25) ($p=0.004$; $p<0.05$).

Table 3. Academic Stress by Age

Academic Stress	18-24 (Gen Z) (n=132)	25-40 (Gen Y) (n=15)	t (p)
<i>Pressures to perform</i>	3.5333±0.62207	3.4133±0.89592	0.674 (0.501)
<i>Perceptions of workload</i>	3.2841±0.78194	2.9167±1.04226	1.663 (0.098)
<i>Academic self-perceptions</i>	2.7898±0.68296	3.3500±0.81723	-2.950 (0.004)
<i>Time restraints</i>	3.0606±0.55182	2.8000±0.72086	1.677 (0.096)

Next, the one-way ANOVA was carried out to determine whether the levels of academic stress of the respondents varied according to the year of study in which students were taking the courses online. The results of the analyses are presented in Table 4.

Table 4. Academic Stress by Year

Year of Study	Academic Stress			
	<i>Pressures to perform</i>	<i>Perceptions of workload</i>	<i>Academic self-perceptions</i>	<i>Time restraints</i>
1 st Year (n=101)	3.4891±0.59227	3.2500±0.75911	2.7847±0.67641	3.0891±0.53803
2 nd Year (n=16)	3.6000±0.62397	3.2031±0.96272	2.6563±0.52341	2.9063±0.43661
3 rd Year (n=14)	3.3143±0.98204	3.2321±1.09397	3.2857±1.06904	2.6607±0.53356
4 th Year (n=10)	3.9200±0.65456	3.5250±0.68160	3.1250±0.74768	3.2250±0.77683
5 th or more (n=6)	3.6667±0.67725	2.8750±0.91856	2.9167±0.30277	3.0000±0.92195
Total (n=147)	3.5211±0.65231	3.2466±0.81562	2.8469±0.71520	3.0340±0.57386
F (p)	1.501 (0.205)	0.609 (0.657)	2.261 (0.066)	2.271 (0.065)

Based on the findings of the one-way ANOVA in Table 4, it was evidently observed that the level of academic stress with its sub-dimensions does not significantly differ according to the year of study.

Subsequently, the one-way ANOVA was performed to determine whether the levels of academic stress of the participants varied in accordance with their satisfaction in the learning environment, and the results are depicted in Table 5.

Table 5. Academic Stress by Learning Environment

Satisfaction with learning environment	Academic Stress			
	<i>Pressures to perform</i>	<i>Perceptions of workload</i>	<i>Academic self-perceptions</i>	<i>Time restraints</i>
Not at all (n=7)	3.4286±0.68730	2.9643±0.26726	2.8214±0.70289	2.8571±0.31810
Not very (n=44)	3.5455±0.66733	3.1534±0.84602	2.7443±0.59183	2.9091±0.49147
Satisfied (n=81)	3.5136±0.61150	3.2901±0.73894	2.8241±0.71200	3.0648±0.51808
Very Satisfied (n=15)	3.5333±0.85077	3.4167±1.21621	3.2833±0.95369	3.3167±0.97955
Total (n=147)	3.5211±0.65231	3.2466±0.81562	2.8469±0.71520	3.0340±0.57386
F (p)	0.071 (0.975)	0.762 (0.517)	2.250 (0.085)	2.265(0.084)

As indicated in Table 5, the findings of the one-way ANOVA results revealed that the level of academic stress with its sub-dimensions does not significantly differ according to the level of satisfaction in the learning environment.

Finally, the one-way ANOVA was used to determine whether the levels of academic stress of the respondents varied with respect to their satisfaction in the home environment, and the results of the analyses are presented in Table 6.

Table 6. Academic Stress by Home Environment

Satisfaction with home environment	Academic Stress			
	<i>Pressures to perform</i>	<i>Perceptions of workload</i>	<i>Academic self-perceptions</i>	<i>Time restraints</i>
Not at all (n=18)	3.4556±0.53051	2.9444±0.69956	2.6667±0.81349	2.8611±0.52316
Not very (n=37)	3.4919±0.61027	3.3108±0.75784	2.7365±0.58910	2.9865±0.47121
Satisfied (n=70)	3.5200±0.64552	3.1929±0.77456	2.8286±0.65738	3.0536±0.55641
Very Satisfied (n=22)	3.6273±0.84017	3.5568±1.03777	3.2386±0.89135	3.1932±0.78274
Total (n=147)	3.5211±0.65231	3.2466±0.81562	2.8469±0.71520	3.034±0.57386
F (p)	0.275 (0.843)	2.109 (0.102)	3.010 (0.032)	1.226 (0.302)
Difference			2-4	

Based on the findings of the one-way ANOVA exhibited in Table 6, it was detected that only the stress levels for the "academic self-perceptions" dimension significantly differ in comparison with the home environment. Therefore, the Tukey analysis was conducted to determine the source of this difference, and it was revealed that the stress level for "academic self-perceptions" in those who were very satisfied with the home environment was higher than the ones who were not very satisfied (p=0.032; p<0.05).

Discussion

In this study, it was aimed to measure the level of academic stress among university students including the components of pressures to perform, perceptions of workload, academic self-perceptions, and time restraints during online learning. Accordingly, it was found that the level of overall academic stress and the sub-dimensions for “perceptions of workload”, “academic self-perceptions”, and “time restraints” were moderate. Similarly, Al Rasheed et al. (2017) also identified a moderate level of stress among university students. Inconsistently, Clabaugh et al. (2021) detected a high level of uncertainty among college students in the U.S. by reporting the risk for academic stress in general. However, in parallel with the study by Clabaugh et al. (2021), the stress level for “pressures to perform” was detected as high in the present research. Consistently, previous literature pointed out that academic stress negatively affects academic performance (Lumley & Provenzano, 2003; Pritchard & Wilson, 2003; Sohail, 2013; Struthers et al., 2000), which can explain why the academic stress for “pressures to perform” was found high.

Regarding the gender variable, this research proved that the level of academic stress does not significantly differ according to gender. Similarly, Akgun and Ciarrochi (2003), in a study with 141 undergraduate students in Australia, found no significant relationship between academic stress and gender. Inconsistently, Misra et al. (2000) supported that a student’s perception of academic stressors can vary depending on gender differences. Unlike the results of this research, prior studies contended that stress is more common among female students (Dusselier, 2005; Pierceall & Keim, 2007).

As for the age variable, it is evident that the stress levels of Gen Y (aged between 25-40) related to the “academic self-perceptions” dimension were higher than those of Gen Z (aged between 18-25). Saxena and Mishra (2021) expressed that Gen Z is more familiar and equipped with technological tools and devices. Cilliers (2017) confirmed that students in Gen Z have a tendency to expect such a learning environment similar to their virtual environment, which means Gen Z feels more comfortable with online learning. Therefore, it is consistent in this study that Gen Y experiences more academic stress in their academic self-perceptions.

According to the findings for the year of study variable, no statistically significant difference in the level of academic stress was detected among students. In other words, students’ year of study is not an effective variable on academic stress during online learning. However, Sabirova et al. (2020), in their study with 119 psychology students, detected the highest levels of academic stress in their first and fourth years at university.

With respect to the learning and home environment variables, no significant difference was detected for the satisfaction in the learning environment in this study whereas it was found that only the stress levels for the “academic self-perceptions” dimension were calculated significantly by the satisfaction in the home environment, which revealed that the stress level for “academic self-perceptions” in students who were very satisfied with the home environment was higher than the ones who were not very satisfied. In other words, students having a higher satisfaction with the home environment had significantly higher levels of academic stress for the sub-dimension of “academic self-perception”. Particularly, this sub-dimension represents students’ worries and fears about being

successful in school and future careers. Oducado and Estoque (2021) highlighted the significance of students' satisfaction with online learning environments, which is a factor in the effectiveness of online education (Fatani, 2020). Similarly, Moawad (2020) detected "home setting" in online learning as a stressor among students. Obviously, satisfaction in the home environment affects students' academic stress during online learning.

Conclusion

In general, stress is a factor that has notable effects on human life, and it is also a fact that academic stress significantly affects the learning processes of students in academic environments in HEIs. In particular, with the rapid transition of online learning into academic life with the COVID-19 pandemic, the fact that online learning environments cause academic stress in students is considerable in terms of effective management of online learning processes. Therefore, this study contributes to the existing literature on academic stress among university students taking online courses because of its aim to measure the level of academic stress in students including the components of pressures to perform, perceptions of workload, academic self-perceptions, and time restraints during online learning. These components facilitate the understanding of academic stress by providing concrete explanations of the concept of academic stress.

To conclude, online learning with its unique strengths and weaknesses is a complicated process to be evaluated for academic stress. In the post-pandemic era, by considering both the positive and negative sides of academic stress among students with a variety of demographic profiles, online learning processes may be designed, implemented, and evaluated in a more efficient way.

Recommendations

Based on the results of this study, some implications and recommendations can be made that provide the online learning processes in HEIs to optimally configure the academic stress level of students. Accordingly, at the administrative level in HEIs, it should be taken into consideration during the phase of planning online learning instructions that the demographic profiles of students together with their learning environments are significant factors in affecting the level of academic stress in students. Therefore, expectations for performance in online learning should be arranged appropriately and kept at an achievable level considering the workload and academic backgrounds of the students.

Regarding the instruction level, lecturers should be aware of the effects of academic stress on students and implement their online classes accordingly. "Academic self-perceptions" of students in Gen Y and Gen Z should be considered for the planning, implementing, and assessing procedures. Deadlines for assignments and projects should be planned so that the dimension of "time restraints" in academic stress among students does not reach such a high level that it blocks learning. Additionally, learning outcomes should not be severely affected by the component of "pressures to perform", which was detected as the highest dimension of academic stress in this research. Therefore, implementation and evaluation processes of online courses should be designed appropriately with respect to the demographic profile of students.

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