

Impact of Technostress on Academic Achievement of University Saudi Students During the Corona Pandemic

Ali Suwayid Alqarni[†] and Ali Mutliq Alosaimi[†]

Umm Al-Qura University, Makkah, Makkah, SA

Summary

This study aimed to ascertain the impact of technostress on the academic achievement of Saudi university students during the Corona pandemic. Adopting the descriptive correlative approach, 387 university students were sampled to investigate the research problem. Two instruments were used in the study: A techno-stress questionnaire and an academic achievement measurement. Data were analyzed statistically, and significant results were obtained from statistical tests – means, standard deviations and Mann-Whitney test. Results showed that the dimension of technology dominance over personal life) has influenced university students, which could be attributable to rapid development connected to technology, which interferes with private life. Other dimensions, including the technical burden and technology invasion of students' personal lives and their psychological instability factor and the technology used at the university, had a positive impact on academic achievement. The technical burden has more effect on the females than the males on the technological pressure scale. Besides, the complexities of using technology reduce academic achievement. Moreover, the measurement of technological pressure has no tangible effect based on the gender variable, which may be due to homogeneity between the male and female participants. They receive the same training and education and practice the same required tasks required. Furthermore, the impact on academic achievement due to gender, academic stage, and major stresses educating students about the effective use of technology and employing it appropriately to promote their educational achievement positively. Apart from rationalizing these findings, the study suggested that less sophisticated technology is used to help learners increase their educational attainment.

Keywords:

Academic achievement, Corona Pandemic, Saudi university students, Technostress

1. Introduction

Educational Technology has mushroomed remarkably in the last few decades. Universities worldwide have increased investment in technology uses to promote and transform the traditional education [1]. This has been

reflected in the increasing number of mobile phones and computers, tablets at higher education institutions [2]. It is now possible to share information – photos, videos through such devices to facilitate learning and teaching and heighten learners' motivation [3].

Having said that, educational technologies must be a vital component of the educational process in general and in university education in particular. The uses of electronic applications increase to meet students' expectations, convert courses into electronic courses, design e-learning management systems (LMS), and exploit students' time on campus through the available electronic services. Add to that developing the performance efficiency of universities through automating academic processes [3-4].

Using technology in the educational process should be appropriate and accurate to generate positive results for students [5]. Wichadee and Pattanapichet [6] and Sartor [7] found that technology, such as the application of Kahoot, for example, has aroused students' interest and increased their productivity in learning. However, with the increase in technology, it may negatively affect their academic achievement, such as a lack of knowledge of technology or delays in delivering assignments on time or creating tension and anxiety among families due to continuous technical addiction [3].

On the other hand, the increased use of technology can lead to negative results, including stress, online bullying, or hacking between individuals [8]. Likewise, the continuous synchronization of technical pressures during the Corona pandemic due to home quarantine has decreased social relations due to its constant use and its negative impact on students' learning [9-10]. Similarly, the nature of technology and its attractions continuously leads to total immersion. This results in individuals' fatigue and stress [11] and thus leads them to move away and search for less dangerous alternatives.

Dhir et al. [12] studied the impact of technology on students between the ages of 12-18 years and used Facebook as technology in India. The results revealed that the increased use of technology causes depression and anxiety. Lim and Choi [13] used three types of applications (Twitter, Facebook, Kaka Tok) on a sample of 446 students from a university in South Korea and their ages ranged from 19-34 years. The results indicated that technological

pressures are represented in increasing emotions, depletion of energy and a volatile mood.

Individuals' anxiety has also increased significantly in light of the spread of the Corona pandemic, and preventive measures have become overwhelming in countries to curb the reach of this virus. Searching for correct information from various sources via the Internet contributed to increasing technical pressure on societies in general and on students who switched to distance education, especially during the pandemic [14].

In terms of the educational process, education in most countries has shifted to distance education during the global epidemic, which has put increasing pressure on societies in general, as well as students in particular, as the results of the study [15] revealed that this experience and its money are positive. Still, they faced challenges represented by poor infrastructure, lack of technical skills, and weak face-to-face social relationships.

Parents' control over technology damage to their children was well before the pandemic. Still, in light of its rapid transition and permanent operation, especially the first months and the subsequent inability to adapt, as well as the increase in technical pressures on them, contributed greatly to the intrusion of this technology on their lives and the need for teachers are given extra time outside of work hours to meet the needs of students in how to best deal with these applications, not to mention the weakness of some teachers in how to use them [16].

Although the transformation of distance education and its money has advantages for both learners and faculty members alike, it is reflected in the students with some negativity as Christian [17] confirmed that the most important thing that students lose during distance education is the real physical closeness. Which had a positive impact on them, and this cannot be provided by the Internet, no matter how advanced it is. Thomas [18] revealed that remote transformation in light of the Corona pandemic had deprived students at the university services that were provided to them in their presence and the attention of their teachers to the importance of performing their duties, as well as the psychological support they received while they were at the university.

The transition to distance education may help shift from the traditional, routine method to motivation and innovation. Still, the speed with which it moved during the pandemic may have hampered this goal [19], as it led to problems related to Internet connectivity and the lack of required resources. Inefficient use and students' lack of attention [20].

The transformation of the educational process during the Corona pandemic has led to the increasing emergence of technology applications that have been widely used to support education in general, such as ZOOM, Skype, Teams, canvas, and E-mail. The difficulties were represented in physical fatigue after long periods of sitting in front of

technology, which takes much time for planning, communicating and acquiring usage skills. As to that, problems related to network weakness during communication and students not showing their faces during the lecture, which causes a great burden on the faculty member [21].

In the same landscape of research, Upadhyaya and Vrinda [4] indicated a more significant impact of the technical invasion on higher education institutions during the Corona pandemic. It led to poor academic productivity and increased mental fatigue among students. Conducting student opinion polls on digital teaching during the Corona pandemic, Messelbach and Buchmann indicated that students do not find participation from their teachers in choosing the technology that suits them, as well as not submitting the duties of the activities required of them in the way they see available to them at the time, and this contributes significantly to the ineffectiveness of online education. Yet significantly from their point of view [22].

Touched on above, it has become urgent to use technology in such a balanced way to help users accomplish their determined objectives of technology integration. Owing to the scarcity of previous studies on the topic of technostress and its relation to academic achievement at Saudi universities during the Corona pandemic, and corresponding to the calls ensued from prior research to reduce technology uses for it has psychological and physical impacts as well as other studies that called for increasing of technology uses as it promotes academic achievements and attracts learners' attention, the research problem of the present paper can be stated in the following overriding research question: What is the relationship between technostress and academic achievement among Saudi university students during the Corona pandemic?

This question subsumes the following sub-questions:

1. What is the level of technostress the Saudi university students have during the corona pandemic?
 2. What is Saudi university students' academic achievement level during the corona pandemic?
 3. Is there any correlation between technostress and academic achievement ?
 4. Are there any statistically significant differences between the means of students' responses to technostress measurement (dimensions and total score) attributed to gender, academic phase, and major variables ?
1. Are there any statistically significant differences between the means of students' responses on academic achievement measurement attributed to gender, academic phase, and major variables?

Method

The study adopted the descriptive correlative approach. The sample was selected in a random cluster manner from the 387 university students.

Instruments

Two instruments were used in the study: Techno-stress questionnaire and academic achievement measurement. The Techno-stress questionnaire was adopted from Upadhyaya and Vrinda (2021). The psychometric features of the tools are outlined below.

Validity and Reliability

The researcher checked the validity of the tool in two ways: expert validity and internal validity. Evidence of internal consistency sincerity. And that they have hereditary, hereditary and hereditary health. In its initial form, the questionnaire was presented to some specialists/experts in the field to get their opinions and make refinements. The validity of internal consistency was also ascertained. For this purpose, calculating the correlation coefficients between each item and the total score of its dimension to the item it belongs to, the results are outlined in Table 1.

Table 1. Results of Internal consistency of the questionnaire

Tech nological burd en		Technologi cal dominance over personal life		technology -related intricacies		psychologi cal instability		Technolog y used On campus	
ite ms	corre latio n	ite ms	correl ation	ite ms	correl ation	ite ms	correl ation	ite ms	corre latio n
1	0.41	1	0.78	1	0.82	1	0.79	1	0.84
2	0.70	2	0.49	2	0.86	2	0.60	2	0.90
3	0.73	3	0.81	3	0.83	3	0.85	3	0.88
4	0.62	4	0.76	4	0.79	4	0.87	4	0.87
5	0.72					5	0.85		

As displayed in Table 1, all the items of the technical burden are consistent with their dimension. The correlations varied between 0.41 and 0.73. Similarly, the items of the dimension of technological dominance over personal life were consistent at the Sig. level 0.01. the correlation varied between 0.49 and 0.81. As for the dimension of technology-related intricacies, all its items were consistent. Their correlations were between 0.79 and 0.86. The results of the dimension of psychological instability were also consistent, wherein the correlations varied between 0.60 and 0.85. Likewise, the dimension of technology used on campus was also consistent at 0.01, and the correlations were between 0.90 and 0.84. This indicates that the correlation of the items with the total score in all dimensions was very high, as the correlation coefficient for all items exceeded 0.05. All items became statistically significant at the level of 0.01, which indicates that the scale has a high degree of validity.

As for reliability of the questionnaire, it was checked by using Alpha Cronbach as outlined in Table 2. As displayed in Table 2, the Cronbach's Alpha of all the questionnaire items is high. The correlation coefficient of

the Technical Burden was 0.65, technological dominance over personal life 0.70, technology-related intricacies 0.84, psychological instability 0.85, and technology used on campus 0.90. As for the overall tool, the correlation coefficient is 0.90. This means that the tool has high acceptable reliability and thus was approved for use in this study.

Table 2. Results of Cronbach's Alpha

Dimension	I tems	Cronba ch's Alpha
Technical Burden	5	0.65
Technological dominance over personal life	4	0.70
technology-related intricacies	4	0.84
psychological instability	5	0.85
Technology used on campus	4	0.90
Tool as a whole	22	0.90

Academic Achievement

The validity of the academic achievement measurement was validated in two ways: expert validity and internal validity. As for expert validity, it was presented to a group of specialized and experienced arbitrators to ensure the degree of appropriateness of the tool. The internal validity was also measured by using the correlation coefficient between the degree of each item with the total score of the dimension to which each item belongs as shown in Table 3. Noticeably, all questionnaire items were consistent with the dimensions they belong to, as it was coefficient at a significance level 0.01 - its correlation coefficient ranged between 0.63 and 0.76. This indicates that the correlation of the items with the total score in all axes was very high, as the correlation coefficient for all items exceeded 0.05 so that all items became statistically significant at the level 0.01, which indicates that the scale has a high degree of internal validity.

Table 3. Internal Validity of the Academic Achievement Measurement

Academic achievement Measurement									
Items	1	2	3	4	5	6	7	8	9
Correl ation	0 6 5	0.7 4	0.6 7	0.67	0.7 2	0. 6 8	0. 7 4	0.7 1	0.7 2
Items	1 0	11	12	13	14	1 5	1 6	17	
Correl ation	0 6 5	0.6 5	0.7 6	0.63	0.7 1	0. 7 0	0. 7 1	0.68	

As for reliability, it was checked using Cronbach's Alpha. The results indicate that the Cronbach's alpha for all items of tool was high. The Cronbach's alpha of the tool as a whole was 0.93. This indicates that it has a very high degree of reliability, and this value was considered

acceptable for conducting using the measurement in this study.

Results

Research Question #1:

What is the level of technostress the Saudi university students have during the Corona pandemic?

To answer the first question, the means score and standard deviations of each dimension on the scale were calculated. The overall mean score was also obtained. The results are outlined in Table 4 below.

Table 4. Means and standard deviations of technostress regarding the first dimension (Technical Burden) of Saudi University Students During Corona pandemic

First Dimension: Technical Burden				
	Items	Degree level		
		Mean	St. D	response
1	Technology enforces me to study faster.	4.03	0.94	strongly agree
2	Doing business through technology has become beyond my power	3.01	1.11	to some extent
3	Technology causes me to change my routine at work to adapt to new technologies	3.01	1.17	to some extent
4	Technology causes me to change my study routine to adapt to new technologies	3.71	1.11	agree
5	Increased technological complexities have increased my workload.	3.03	1.17	to some extent
Overall Mean		3.36	1.1	to some extent

Table 4 displays the degree of technostress related to the first dimension: the Technical Burden on Saudi university students during the Corona pandemic. Noticeably, Item 1 ranked first (Mean score = 4.03) with a response (strongly agree). On the other hand, the smallest value relates to Items 2 and 3 whose mean values are 3.01 with a response (medium). The overall mean of the questionnaire is 3.36, with a response rate (moderate).

Table 5: Means and standard deviations of technostress regarding the second dimension (Technological dominance over personal life) of Saudi University Students During Corona pandemic

Second Dimension: Technological dominance over personal life				
	Items	Level		
		Mean	St. D	Response
6	I don't find enough time to sit with my family because of technology	3.19	1.24	to some extent
7	Because of technology, I continue doing my academic duties even while I was on vacation.	4.02	0.92	agree
8	It's hard for me to enjoy my vacation or weekend time because of pursuing the latest technology	3.26	1.20	to some extent
9	I feel like technology is taking over my personal life.	3.58	1.16	agree
Overall mean		3.51	1.13	agree

Table 5 displays the degree of technostress related to the second dimension: Technological dominance over personal life of Saudi university students during corona pandemic. Noticeably, Item 7 ranked first (Mean score = 4.02) with a response (agree). On the other hand, the smallest value relates to Items 6 whose mean value is 3.19 with a response (medium). The overall mean of the questionnaire is 3.51, with a response rate (agree).

Table 6. Means and standard deviations of technostress regarding the third dimension (Technology-related intricacies) of Saudi University Students During Corona pandemic

Third Dimension: technology-related intricacies				
	Items	Level		
		Mean	St. D	Response
10	I don't have enough knowledge of using technology to deal with academic requirements.	2.63	1.17	to some extent
11	It takes a long time to understand and use modern technologies	2.67	1.18	to some extent
12	I don't have enough time to develop my technical skills	2.89	1.14	to some extent
13	My college classmates have more information about technology than I do.	2.86	1.07	to some extent
Overall Mean		2.76	1.14	to some extent

Data in Table 6 indicates, the degree of technostress related to the third dimension: technology-related intricacies of Saudi university students during corona pandemic. In the table, Item 12 ranked first (Mean score = 2.89) with a response (moderate). On the other hand, the smallest value relates to Items 10 whose mean value is 2.63 with a response (to some extent). The overall mean of the questionnaire is 2.76, with a response rate (moderate).

Table 7. Means and Standard deviations of technostress regarding the Fourth dimension (psychological instability) of Saudi University Students During Corona pandemic

Fourth Dimension: psychological instability				
	Items	Level		
		Mean	St. D	Response
14	I feel that new technologies constantly threaten my performance.	2.69	1.19	to some extent
15	I need to update my skills constantly to avoid poor performance.	3.73	1.02	agree
16	I feel anxious when comparing my level of skills in modern technologies with my colleagues at the university.	2.82	1.21	to some extent
17	I refrain from sharing knowledge with my colleagues because of my fear of my poor technical performance.	2.47	1.16	disagree
18	I feel that knowledge sharing among my colleagues is weak due to fear of poor technical performance.	2.52	1.16	disagree
Overall Mean		2.85	1.15	to some extent

Data in Table 7 indicates, the degree of technostress related to the fourth dimension: psychological instability of Saudi university students during corona pandemic. In the table, Item 16 ranked first (Mean score =2.82) with a response (moderate). On the other hand, the smallest value relates to Items 10 whose mean value is 2.47 with a response (disagree). The overall mean of the questionnaire is 2.85, with a response rate (moderate).

Table 8. Means and Standard deviations of technostress regarding the Fifth dimension (Technology used on campus) of Saudi University Students During Corona pandemic

Fifth Dimension: Technology On campus				
	Items	level		
		Mean	St. D	Response
19	My university constantly updates the technologies I use.	3.38	.10	to some extent
20	My university makes permanent changes to the software I work on.	3.22	.05	to some extent
21	My university makes permanent changes to the computers I work on.	2.82	.11	to some extent
22	My university periodically updates its computer networks.	3.12	.08	to some extent
Overall Mean		2.85	.15	to some extent

Data in Table 8 indicates, the degree of technostress related to the fifth dimension (Technology used on campus) of Saudi university students during corona pandemic. In the

table, Item 19 ranked first (Mean score =3.38) with a response (moderate). On the other hand, the smallest value relates to Items 21 whose mean value is 2.82 with a response (moderate). The overall mean of the questionnaire is 2.85, with a response rate (moderate).

Table 9. Means and Standard deviations of techno-stress Measurement Scale of Saudi University Students During Corona pandemic

	items	Level of Score		
		Mean	St. D	Response
1	Technology enforces me to study faster.	4.03	0.94	strongly agree
2	Doing business through technology has become beyond my power	3.01	1.11	to some extent
3	Technology causes me to change my routine at work to adapt to new technologies.	3.01	1.17	to some extent
4	Technology causes me to change my study routine to adapt to new technologies	3.71	1.11	agree
5	Increased technological complexities have increased my workload.	3.03	1.17	to some extent
6	I don't have enough time to sit with my family because of technology	3.19	1.24	to some extent
7	Because of technology, I continue doing my academic duties even while I was on vacation.	4.02	0.92	agree
8	It is hard for me to enjoy my vacation or weekend time because of pursuing the latest technology	3.26	1.20	to some extent
9	I feel like technology is taking over my personal life	3.58	1.16	agree
10	I don't have enough knowledge of using technology to deal with academic requirements.	2.63	1.17	to some extent
11	It takes a long time to understand and use modern technologies	2.67	1.18	to some extent
12	I don't have enough time to develop my technical skills	2.89	1.14	to some extent
13	My college classmates have more information about technology than I do.	2.86	1.07	to some extent
14	I feel that new technologies constantly threaten my performance.	2.69	1.19	to some extent
15	I need to update my skills constantly to avoid poor performance.	3.73	1.02	agree
16	I feel anxious when comparing my level of skills in modern technologies with my colleagues at the university.	2.82	1.21	to some extent
17	I refrain from sharing knowledge with my colleagues because of my fear of my poor technical performance.	2.47	1.16	disagree
18	I feel that knowledge sharing among my colleagues is weak due to fear of poor technical performance.	2.52	1.16	disagree
19	My university constantly updates the technologies I use.	3.38	1.10	to some extent
20	My university makes permanent changes to the software I work on.	3.22	1.05	to some extent
21	My university makes permanent changes to computers I work on.	2.82	1.11	to some extent

22	My university periodically updates its computer networks.	3.12	1.08	to some extent
Overall Mean		3.21	1.12	to some extent

As Table 9 shows, the degree of technostress of Saudi male and female university students during corona pandemic. It was measured through the 22-item questionnaire. As displayed in the table, Item 9 ranked first (Mean score =4.03) with a response (strongly agree). On the other hand, the smallest value relates to Items 17 whose mean value is 2.47 with a response (moderate). The overall mean of the questionnaire is 3.21, with a response rate (moderate).

Research Question 2:

What is the level of academic achievement of Saudi university students towards learning during the Corona pandemic?

In a bid to answer this research question, the means values and standard deviations of each item in the dimension as well as the overall mean were calculated. The results are outlined in Table 10.

Table 10. Means and Standard deviations of Academic Achievement of Saudi University Students During Corona pandemic

	Items	Level of Score		
		Mean	St. D	Response
1	I Develop a study plan for my academic studies.	3.82	0.95	agree
2	I complete tasks and assignments faster.	3.95	0.86	agree
3	I deepen my understanding of the material by asking questions and discussions electronically.	3.69	1.04	agree
4	I change my study skills if understanding the lecture and lessons is challenging.	3.93	0.87	agree
5	I set up specific objectives to organize my learning.	3.96	0.87	agree
6	I take important notes at lesson time.	3.96	0.93	agree
7	I arrange the main and important ideas in the course.	3.98	0.91	agree
8	I adjust my study plan if some urgent unplanned assignments or tests are added now and then.	3.99	0.88	agree
9	I provide all the requirements needed for the focus of my study.	4.08	0.84	agree
10	I think I am fully responsible for organizing my learning.	4.16	0.90	agree
11	I contact my colleagues on the Internet to complete the required projects.	4.19	0.85	agree
12	I think I am making good progress in my learning.	4.09	0.85	agree
13	I see that distance learning is effective learning.	3.75	1.16	agree
14	I can access the information I look for easily.	4.13	0.87	agree

15	I work hard to improve my performance at university.	4.27	0.76	strongly agree
16	I do what I should do to the best of my ability.	4.27	0.77	strongly agree
17	I face different academic situations with full responsibility.	4.22	0.82	strongly agree
Overall Mean		4.02	0.89	agree

Results outlined in Table 10 illustrate the level of academic achievement of male and female students at Saudi universities during the coronavirus crisis. It was measured through 17 items in the questionnaire. As displayed in the table, Item 15 ranked first (Mean score =4.27) with a response (strongly agree). On the other hand, the smallest value (ranking last) relates to Items 3 whose mean value is 3.69 with a response (agree). The overall mean of the questionnaire is 4.02, with a response rate (agree).

Research Question 3:

Is there a relationship between technostress and academic achievement?

To answer this question, the correlation coefficient between each technological stress on the measurement was calculated and the result are shown in Table 11.

Table 11. Pearson's Correlation Scale between the Techno-stress Variables and Academic Achievement

			Academic achievement
Techno-stress measurement	Technical Burden	Correlation Coef.	0.081
		St. D. N	0.11387
	Technological dominance over personal life	Correlation Coef.	0.062
		St. D. N	0.22387
	technology-related intricacies	Correlation Coef.	-0.080
		St. D. N	0.11378
	psychological instability	Correlation Coef.	0.000
St. D. N		0.99378	
Technology used on campus	Correlation Coef.	.300**	
	St. D. N	less than 0.001378	
Questionnaire as a whole	Correlation Coef.	0.095	
	St. D.	0.062387	

		N	
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Results outlined in Table 11 illustrate the correlation between the academic achievement measurement and dimensions of techno-stress scale (Technical Burden, technological dominance over personal life, psychological instability, and technology used on campus) was positive, yet weak. On the other hand, the correlation between the academic achievement measurement and the dimension of technology-related intricacies was negative, yet weak. In the same token, the correlation between the techno-stress scale as a whole and academic achievement measurement was a weak positive correlation

Research Question 4:

Are there statistically significant differences between the mean scores of students on the techno-stress measurement (dimensions- total score) based on the variables of gender, academic stage, and major?

To answer this research question, the Mann-Whitney test was used to answer this question, and the results are outlined in Table 12.

Table 12. Mann-Whitney test for techno-stress Measurement at the levels of Dimensions and Total Score based on the Variable of Gender

	Gender	Male	Female
Dimension 1: Technological burden	sample	196	191
	rank	174.70	213.81
	Test value	11.91	
	Level of Sig.	0.0005	
	Decision	Sig. at 0.05	
Dimension 2: Technological dominance over personal life	sample	196	191
	rank	184.18	204.08
	Test value	3.08	
	Level of Sig.	0.07	
	Decision	Not Sig. at 0.05	
Dimension 3: technology-related intricacies	sample	196	191
	rank	185.11	203.12
	Test value	2.52	
	Level of Sig.	0.11	
	Decision	Not Sig. at 0.05	
Dimension 4: psychological instability	sample	196	191
	rank	188.10	200.05
	Test value	1.10	
	Level of Sig.	0.29	
	Decision	Not Sig. at 0.05	
Dimension 5: Technology used On campus	sample	196	191
	rank	178.75	209.65
	Test value	7.45	
	Level of Sig.	0.006	

	Decision	Sig. at 0.05	
Scale Dimensions	sample	196	191
	rank	179.44	208.94
	Test value	6.73	
	Level of Sig.	0.009	
	Decision	Sig. at 0.05	

Table 12 shows the results of analysis of variance by the Mann Whitney test for the technological stress scale at the level (dimensions - total degree) according to the gender variable. It indicates statistically significant differences in the first dimension (the technical burden) and the fifth dimension (the technology used in the university between the male and female groups) in favor of the females. It also indicates no statistically significant differences between the male and female groups in the second dimension (the complexities of using technology), and the fourth dimension (psychological instability). At the same time, there were statistically significant differences in the scale between the male and female groups in favor of females.

Table 13. Mann-Whitney test for techno-stress Measurement at the levels of dimensions and total score based on the variable of academic stage

Dimensions	Academic stage	Bachelor's	Higher studies
Dimension 1: Technological burden	sample	241	146
	rank	201.96	180.86
	Test value	3.25	
	Level of Sig.	0.071	
	Decision	Not Sig. at 0.05	
Dimension 2: Technological dominance over personal life	sample	241	146
	rank	190.91	199.11
	Test value	0.49	
	Level of Sig.	0.48	
	Decision	Not Sig. at 0.05	
Dimension 3: technology-related intricacies	sample	241	146
	rank	196.79	189.39
	Test value	0.40	
	Level of Sig.	0.52	
	Decision	Not Sig. at 0.05	
Dimension 4: psychological instability	sample	241	146
	rank	194.59	193.03
	Test value	0.01	
	Level of Sig.	0.89	
	Decision	Not Sig. at 0.05	

Dimension 5: Technology used on campus	sample	241	146
	rank	188.38	203.27
	Test value	1.62	
	Level of Sig.	0.20	
	Decision	Not Sig. at 0.05	
Scale Dimensions	sample	241	146
	rank	194.63	192.96
	Test value	0.20	
	Level of Sig.	0.88	
	Decision	Not Sig. at 0.05	

As the table indicates, there are no statistically significant differences in the level of dimensions and total degree between the two groups of undergraduate and graduate students based on the analysis of variance using the Mann Whitney test for technostress.

Table 14. Mann-Whitney test for technological stress scale at the levels of dimensions and total score based on the variable of Major

Dimensions	Major	Scientific	Theoretical
Dimension 1: Technological burden	sample	215	172
	rank	190.00	199.01
	Test value	0.62	
	Level of Sig.	0.42	
	Decision	Not Sig. at 0.05	
Dimension 2: Technological dominance over personal life	sample	215	172
	rank	191.19	197.51
	Test value	0.30	
	Level of Sig.	0.57	
	Decision	Not Sig. at 0.05	
Dimension 3: technology-related intricacies	sample	215	172
	rank	188.00	201.51
	Test value	1.40	
	Level of Sig.	0.23	
	Decision	Not Sig. at 0.05	
Dimension 4: psychological instability	sample		
	rank	194.73	193.08
	Test value	0.02	
	Level of Sig.	0.88	
	Decision	Not Sig. at 0.05	
	sample	215	172
	rank	189.58	199.53

Dimension 5: Technology used On campus	Test value	0.76	
	Level of Sig.	0.38	
	Decision	Not Sig. at 0.05	
Dimensions (Scale as a whole)	sample	215	172
	rank	189.93	199.09
	Test value	0.64	
	Level of Sig.	0.42	
	Decision	Not Sig. at 0.05	

The table shows the results of the Mann-Whitney test to analogize the variance of the technological stress measurement at the level of dimensions and total degree based on the variable of major. As displayed in the data, there are no statistically significant differences between the two scientific and theoretical student groups.

Research Question 5:

Are there statistically significant differences between the mean scores of students on the academic achievement scale based on the variables of gender, academic stage, and specialization?

To answer this research question, The Mann-Whitney test was used to compare the distribution of several independent groups, as shown in Table 15.

Table 15. Mann Whitney Test to measure Academic Achievement based on the Variable of Gender, Academic Stage and Major

	Gender	Male	Female
	Measurement of Academic achievement	sample	196
rank		187.98	200.18
Test value		1.15	
Level of Sig.		0.28	
Decision		Not Sig. at 0.05	
Measurement of Academic achievement	Academic stage	Bachelor's	Higher studies
	sample	241	146
	rank	184.19	210.20
	Test value	4.92	
	Level of Sig.	0.02	
	Decision	Sig. at 0.05	
Measurement of Academic achievement	Major	Scientific	Theoretical
	sample	215	172
	rank	190.45	198.44
	Test value	0.48	
	Level of Sig.	0.48	
	Decision	Not Sig. at 0.05	

Table 15 shows the analysis of variance using the Mann-Whitney test to measure academic achievement according to the variables of gender, academic stage, and major. There are no statistically significant differences between the male and female groups. There are also statistically significant differences in the academic achievement scale between the two groups of undergraduate students and graduate students, in favor of graduate students. At the same time, it was found that there are no statistically significant differences in the measure of academic achievement between the two groups of scientific students and theoretical students.

Discussion

The results clearly show that the second dimension (dominance of technology over personal life) has influences on university students. This could be attributed to the fact that rapid development connected to technology interferes with private life. It could also be due to such technological development being necessary for official, health, or even educational requirements, causing immersion in technology and loss of personal freedom. However, the results of the other dimensions were moderate, including the dimensions of technical burden, complexities of using technology, psychological instability, and the technology used at the university. The technological pressure scale as a whole came at an average level. This result is consistent with Upadhyaya and Vrinda [4], which may be attributed to the sample's technical maturity, reflected in a good balance of their technology uses. It could also be due to individuals' professionalism in using technology, especially this generation who can fulfill their academic requirements and communicate with their peers or teachers without tangible pressure. Another rationale for the results related to the Corona pandemic. The participants, during the pandemic, had more time to work with technology appropriately without other pressures that may hinder their everyday uses.

Likewise, the results indicate that the degree of academic achievement was a degree of "agree" – this is partially endorsed by Cong Qi [2] and Hossain et al. [3]. It could be attributed to the fact that the sample was free from other work during the Corona pandemic. They were obliged to stay indoors, giving way to full-time study and the required duties, which led to progress in their educational attainment. Nevertheless, Upadhyaya and Vrinda [4], Rucha et al. [20] and Alvarez-Risco et al. [14] came up with reverse findings. This counterparty may stem from the total transition of technology during the pandemic and remote study contributed to overcoming difficulties that may hinder academic achievement, represented in the ease of connecting to the Internet with teachers and peers and benefiting from the flexibility of time and place, the comfort of sending assignments and the speed of providing feedback to them easily, ease of access to information and its sources,

and other Features that facilitated and supported students' academic achievement. It may also be attributed to faculty members' flexibility in the evaluation methods used during the Corona pandemic period.

It is also clear from the results that the complexities of using technology reduce academic achievement. This is consistent with Alvarez-Risco et al. [14] and Upadhyaya & Vrinda [4], which may be explained by the rapid transformation to technology. It may make students not understand its use well. It may require sufficient time to master it, causing a loss of educational attainment during the time, or it may be because the technology used requires sufficient training to be dealt with well in light of the continuation of the study promptly and missing many lessons, which is reflected on their academic achievement.

However, other dimensions had a positive impact on academic achievement, including the technical burden and technology invasion of students' personal lives and their psychological instability factor and the technology used at the university. This is partly consistent with Cong Qi [2] and Hossain et al. [3] and differs from Upadhyaya & Vrinda [4], Rucha et al. [20], and Alvarez-Risco et al. [14]. This may be attributed to the extent of the technical and cultural development of the male and female students in the geographical area of the sample, which was reflected in the absence of technological pressure Concrete and influence on academic achievement, as it may be that the sample members possess a good technical balance, and use technology in an expert and appropriate manner, which was reflected in the level of their academic achievement positively. It may also be due to the absence of a weakness in the infrastructure of the sample and the good technical equipment owned by their educational institutions, which contributed to the absence of obstacles hindering their communication to educational attainment and academic achievement.

The results also show the technical burden has more impact on the females than the males on the technological pressure scale. This may be because the females' teaching method is more demanding, reflected in an increase in their burdens to accomplish what was requested. It may also be attributed to the weakness of female technical training to deal with technology, leading to the inability to deal appropriately with technology. This, in turn, increased their technical burden, the result of which is consistent with the study Wang et al. [1].

Scrutinizing the overall measurement, the results show that the measurement of technological pressure has no tangible effect based on the gender variable, which may be due to the presence of homogeneity between the male and female participants and that they receive the same training and education and practice the same required tasks required. Given the variables of both major and academic stage, there was no apparent effect, probably due to all disciplines or academic stages at the university having different methods

of appropriate technical diversification, which contributed to creating a balance among the sample and hindered any technological pressures may occur. It may be explained by the similarity of educational conditions for all disciplines or academic stages and the absence of what distinguishes one specialty from another or one stage from another. That is, they are similar in circumstances and deal with them in the same way. Also, during the Corona pandemic, all academic disciplines or stages provide educational lessons and duties through unified study systems that do not differ according to gender, major or academic stage, such as the country's board system, for example, which the university adopts.

Additionally, the results illustrate that there is no tangible impact on academic achievement due to the variable of gender, academic stage, and major. This may be attributed to the homogeneity among the sample and insignificant differences between them. There is not necessarily an academic achievement that depends on the variables of gender, academic stage or specialization, but rather the ability of the sample to plan well, follow up on the new, and continuous communication to reach their goals. It may also be attributed to the fact that they experienced the same circumstances during the Corona pandemic; the interruption of home confinement that led to the unification of educational methods by faculty members through their use of technology caused the absence of differences that distinguished one group from another as a result. One more reason may relate to the evaluation procedures at the university with the sample during the tests during the pandemic "from a distance," through which individual differences may be revealed, as well as differences between specializations, academic stages, or even gender, as it may be that all the sample is emptied during the pandemic. There is nothing to occupy them except the study led to no significant differences at the level of variables.

In conclusion, the study stresses educating students about the effective use of technology and employing it appropriately in a way that positively promotes their educational achievement. Appropriate and less sophisticated technology should be chosen to help them increase their educational attainment.

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Ali Alqarni received the B.E. from Teacher College in Jeddah in 2004, and M.E. degree from Umm Al-Qura Univ. in 2010. He received the PhD. from Southern Illinois Univ. in 2016. After working as a computer teacher from 2005 to 2010, an assistant professor (from 2016) in the Dept. of Curriculum and Instruction, Umm Al-Qura Univ., he has been an associate professor at Umm Al-Qura Univ. since 2020. His research interest includes educational technology, e-learning, using computer in education.

Ali Alosaimi received the B.E. from Taif University in 2005, and M.E. degree from Baha Univ. in 2013. He is a teacher and studying his Ph.D at Umm Al-Qura University.