The Impact of COVID-19 on Students' Class Experience

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Abstract. The COVID-19 pandemic impact on almost the whole world, also had a significant impact on students, who experienced changes in the way they attended classes, from offline face-to-face instruction to online distance learning. To explore the influential factors affecting students' classroom experience, correlation analysis, regression analysis and ANOVA were conducted on a cross-sectional survey regarding 1182 students from different age groups and educational institutions in the National Capital Region of Delhi. The results showed that online classroom experience scores were positively correlated with time spent in online classes and negatively correlated with time spent on social media. Lack of classroom contact and unreasonable scheduling significantly affected student satisfaction. This work demonstrates the correlation between some of the influencing factors and classroom satisfaction, so that education professionals can better tailor their approach to educating students and improving the effectiveness of teaching and receiving instruction between teachers and students, and contribute to distance education efforts.

Keywords: COVID-19, students, correlation analysis impact, online class, regression analysis, ANOVA.

1 Introduction

The outbreak of COVID-19 in early 2020 was unprecedented in modern times, forcing campuses to temporarily close, shifting courses to distance delivery, and changing the way we all live. The epidemic has also had a significant impact on the students, with qualitative changes in the way they attend classes, a much lower standard of living and consumption, and their physical fitness fading day by day due to the isolation at home, and a significant degree of restriction on their social practices and social activities. In addition, many educational institutions are even encountering online teaching for the first time, which makes the transition particularly demanding for them, as they have little time to adapt to the new way of education. Thus, as Sadeghi says, online education also has many drawbacks: easy distraction, use of complex technology, no social activities, difficulty staying in touch with instructors, and a job market that does not accept online degrees [1]. The COVID-19 pandemic has affected approximately 1.6 billion students in more than 200 countries, causing the greatest disruption of education systems in human history [2]. The survey found that COVID-19 caused 13% of students

to postpone graduation, 40% to lose employment, internships, or work chances, and 29% to anticipate having lower earnings by the time they are 35. These impacts also varied. In response to the new crown pneumonia outbreak, students in one quarter increased their study time by more than 4 hours per week, while students in another quarter decreased their study time by more than 5 hours per week [3]. And online education affects students' health, as long periods of sedentary time may promote obesity and cardiovascular disease [4,5]. In order to understand how the COVID-19 epidemic has affected students' learning, this research analyses data from a questionnaire that asks about learning hours for self-study and online classes, sleep length, time spent exercising and sleeping, and other factors. Students can utilize these conclusions to determine the best solutions as they change the way they study in order to enhance the course experience during this and any future pandemic.

2   Data

In this study, a cross-sectional survey of 1182 students from various age groups and educational institutions in the Delhi National Capital Region (NCR) is done [6].

2.1   Analysis

2.1.1 Participants characteristics.
From Figure 1, this work can show that the mean age is 20.16 years and the 95% confidence interval is between 19.86 and 20.47. The participants' ages were evenly distributed.
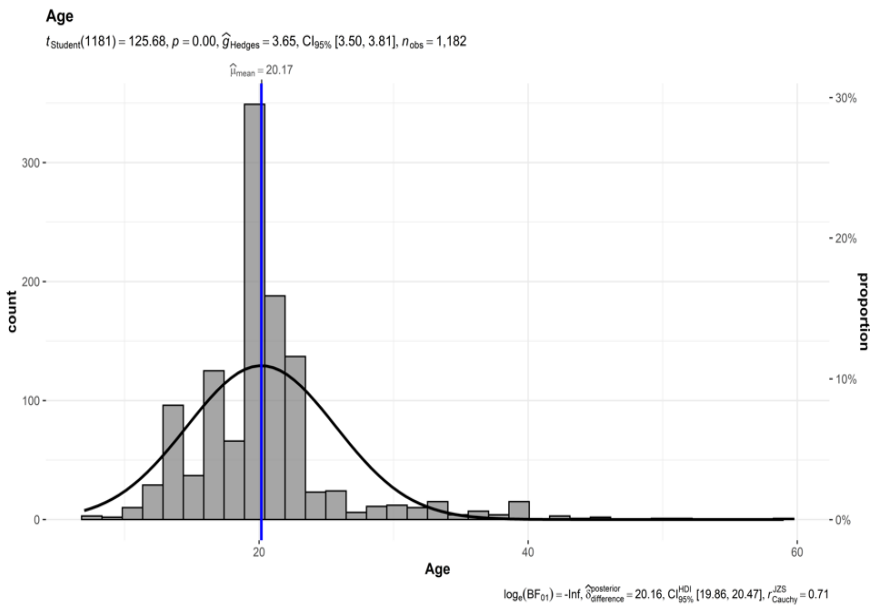

Age

$t_{Student}(1181) = 125.68$, $p = 0.00$, $\hat{g}_{Hedges} = 3.65$, $CI_{95\%}$ [3.50, 3.81], $n_{obs} = 1,182$

$\hat{\mu}_{mean} = 20.17$

$\log_e(BF_{01}) = -Inf$, $\hat{\delta}_{difference}^{posterior} = 20.16$, $CI_{95\%}^{HDI}$ [19.86, 20.47], $r_{Cauchy}^{JZS} = 0.71$

Fig. 1. Age of participants [Owner-draw].

In terms of region of residence, as shown in Figure 2, 721 (61%) of the respondents resided in Delhi-NCR during the pandemic, while the remaining respondents were located outside of Delhi-NCR.
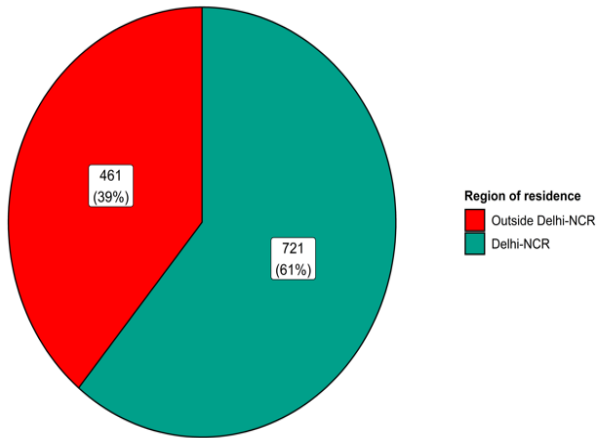

Fig. 2. Region of residence [Owner-draw].

2.1.2 Independent variables.

This study chose a variety of independent variables, such as time spent engaged in various activities (online learning, independent study, fitness, sleep, social media, and television), whether or not students experienced health issues during lockdown, how satisfied they were with their time management, and whether or not they felt more connected to their family, close friends, and relatives. The following table and figures are preliminary descriptive statistic for independent variables. This work is shown as Table1, Figure 3 and Figure 4.

Table 1. Numerical summary of time spent on daily activities [Owner-draw].

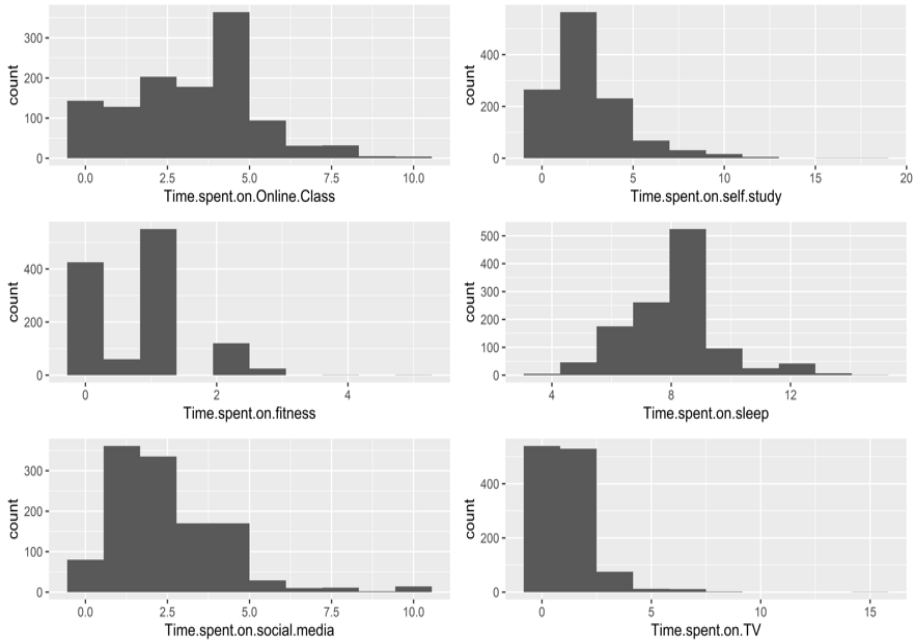|	online class	self-study	fitness	sleep	social media	TV
Min	0.000	0.000	0.000	4.000	0.000	0.000
Median	3.000	2.000	1.000	8.000	2.000	1.000
Mean	3.209	2.912	0.7568	7.871	2.366	1.025
Max	10.000	18.000	5.000	15.000	10.000	15.000

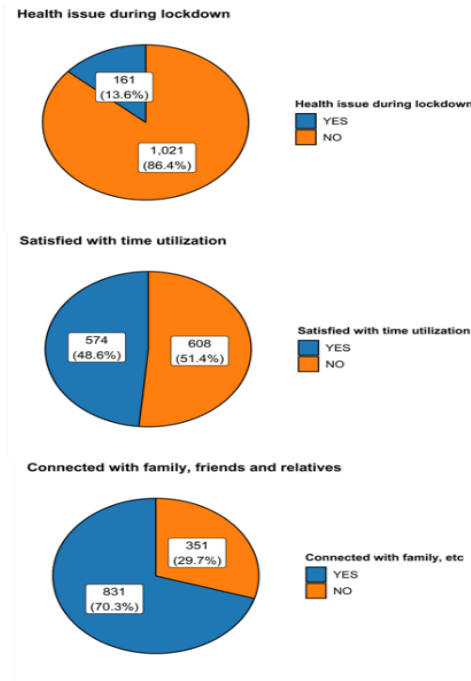**Fig. 3.** Graphical summary of time spent on daily activities [Owner-draw].

Fig. 4. Pie charts of categorical variables [Owner-draw].

2.1.3 Dependent variable.

The aim of this article is to figure out what might be factors that affect a student's class experience, so the dependent variable is student's rating of online class experience which is divided into five levels: very poor, poor, average, good, excellent. The data is shown as in Figure 5.
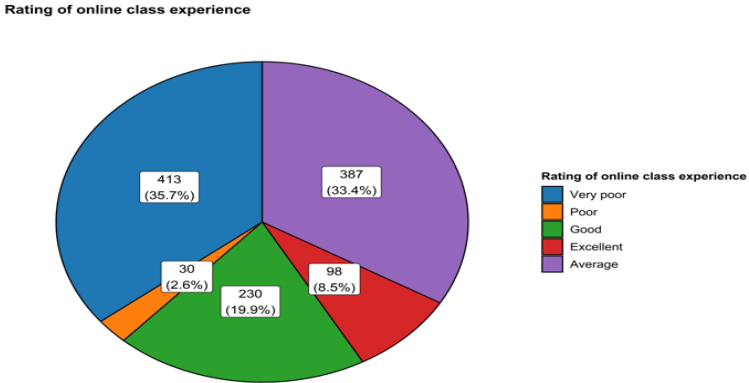

Fig. 5. Rating of online class experience [Owner-draw].

2.2   Correlation Analysis

After recoding the categorical variables in the related variables, analyze the correlation between the independent variable and the dependent variables and get a correlation matrix shown in Figure 6.
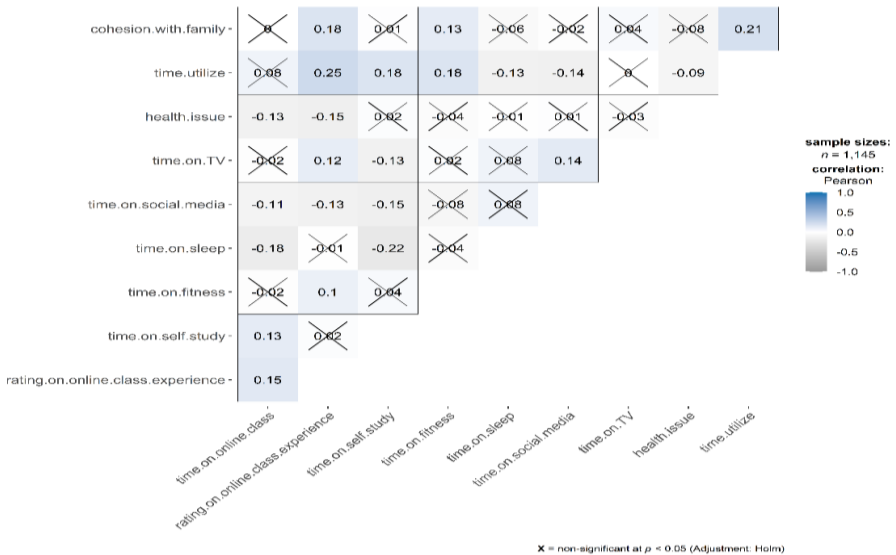

Fig. 6. Correlation matrix [Owner-draw].

According to the results shown in Figure 6, the rating pf online class experience is positively correlated with time spent on online classes, fitness, TV and time utilization satisfaction and cohesion with family, while negatively correlated with time spent on social media and health issue.

2.3   Linear regression model

In order to more accurately describe the influence of independent variables on the rating of online class experience, this work select the independent variables in the correlation analysis that have a significant correlation with the dependent variable to build a linear regression model. The specific information of the model is shown in the following Table 2, Table 3 and Table 4.

Table 2. Model Summary [Owner-draw].

Model Summary									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.370a	.137	.132	1.270	.137	25.799	7	1137	.000
a. Predictors: (Constant), cohesion.with.family, time.on.online.class, time.on.TV, time.on.fitness, health.issue, time.on.social.media, time.utilize									

From the above table, it can be concluded that a large portion of the variance cannot be explained by regression model-el due to the relatively small adjusted R-squared, with results as low as 13.2%. The goodness of fit is relatively low.

Table 3. ANOVA [Owner-draw]

ANOVAa					
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	291.112	7	41.587	25.799	.000b
	Residual	1832.827	1137	1.612		
	Total	2123.939	1144			
a. Dependent Variable: rating.on.online.class.experience					
b. Predictors: (Constant), cohesion.with.family, time.on.online.class, time.on.TV, time.on.fitness, health.issue, time.on.social.media, time.utilize					

In the ANOVA results, $F = 25.799$, p-value < 0.05, the model was statistically significant. And the relatively high F-values indicate that at least the explanatory variables must be available to be meaningful and the model is reasonable and acceptable. Therefore, this model has some predictive value.

Table 4. Coefficient [Owner-draw].

	Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
1	(Constant)	.933	.123		7.596	.000	.692	1.174
	time.on.online.class	.077	.018	.117	4.193	.000	.041	.113
	time.on.fitness	.063	.054	.033	1.160	.246	-.043	.169
	time.on.social.media	-.084	.022	-.107	-3.795	.000	-.128	-.041
	time.on.TV	.142	.030	.133	4.772	.000	.084	.201
	time.utilize	.514	.079	.189	6.532	.000	.360	.669
	health.issue	-.402	.110	-.102	-3.640	.000	-.619	-.185
	cohesion.with.family	.363	.085	.122	4.287	.000	.197	.529

a. Dependent Variable: rating.on.online.class.experience

According to above table, the regression formula is:

$$\bar{y} = 0.933 + 0.77x_1 + 0.63x_2 - 0.84x_3 + 0.142x_4 + 0.514x_5 - 0.402x_6 + 0.363x_7$$

This Function is a simple and clear response to the correlation of each independent variable with the rating of online class experience (dependent variable). It can conclude that appropriate increases in all but two of the time on social media and health issue during lockdown factors of the independent variables would contribute to the course experience. However, the significance of time spent on fitness was high, greater than 0.05, so it was excluded for now.

3   Implication

Once the Coronavirus outbreak is over and educational facilities reopen, the authorities should continue to invest in online education to improve the learning experience. In addition, many students may feel stress, anxiety, and depression due to the effects of the COVID-19 Pneumonia outbreak, making it necessary to provide emotional support for students. Also, the upgrading of educational resources and the training of teachers' ability to teach online should be carried out simultaneously. The sudden outbreak of the epidemic and the implementation of online teaching caught inexperienced teachers and professors off guard. Teachers need to have a high level of professionalism to manage the classroom online, to develop interaction between teachers and students, and to review assignments submitted online. In particular, teachers who are old and close to retirement or who are not good at using multimedia information technology often experience silence and disconnections when teaching online.

4   Conclusion

All aspects of society have been affected by the new crown pneumonia pandemic. Closing offline educational institutions to prevent the spread of the virus is one of the most recent modifications made. However, in the long run, these actions may affect the lives of students. Therefore, in this study, this work examined how the COVID-19 pandemic affects students' academic, health, and social lives and present findings on how it affects these outcomes. Results showed that online classroom experience scores were positively associated with online classroom time, exercise time, television viewing time, time use satisfaction, and family cohesion, and negatively associated with time spent on social media and health concerns during lockdown. Lack of classroom exposure and unreasonable schedules greatly impacted student satisfaction. People are motivated to make an effort to learn and develop social skills in the classroom by reciprocal influences, which may not be possible in an online environment.

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