

Online Versus Offline Learning: A Comparative analysis of Modes of Education amidst pandemic

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ABSTRACT

Following the second wave of the current pandemic COVID-19, education transmission is occurring via both the modes of education that is, online as well as offline in the college. The aim of the current study was, therefore, to bring forth the comparative analysis of both the modes of education and their impact on the levels of academic stress and states of the mental wellbeing of the students amidst the current pandemic. Measures of the constructs were obtained by the online Google forms, which consist of the Perceptions of Academic Stress Scale (PASS) by Dalia Bedewy and Adel Gabriel (2015) and Warwick-Edinburg Mental Well-being Scale (2008), from a sample of 100 undergraduate students aged 19-25 years studying in different colleges of Bengaluru, India. Modes of education were treated as the predictor variables whilst academic stress and mental wellbeing constituted the criterion variables. Two-way ANOVA was employed. Results show that the levels of academic stress are found to be a bit higher in students attending online classes as compared to those taking offline classes in college ($MD=1.10$, $df=98$, $t=0.590$, $p>0.05$), whereas mental wellbeing is found to be low in students attending offline classes in colleges than those taking online classes ($MD=5.180$, $df=98$, $t=2.340$, $p>0.05$ level). The combined interactional effect of modes of education and academic stress on the states of the mental wellbeing of the students is found to be low ($R^2=0.053$), whilst the combined impact of modes of education and mental wellbeing on the levels of academic stress was found to be quite low ($R^2=0.014$). It was concluded that modes of education have an impact on levels of academic stress and states of the mental well-being of the students amidst the current pandemic, but it is low.

Keywords: *Modes of Education, Online Learning, Offline Learning, pandemic*

Education is the tool through which society pass on its accumulated knowledge and skills across generations. Modes of education are the means through which this transmission of the knowledge takes place. It can be broadly divided into offline and online modes of learning. Offline mode of education is the traditional way of learning which is a teacher-directed learning in a setting where course implementation takes place with face-to-face interactions that occur in a physical location, such as on a college campus wherein students are taught largely by the teacher (the "sage on the stage") and/or through the use of materials including books, journals, audio, and video tapes (IGI, Global

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dictionary, 2021). This refers to lecture-based learning where teacher moderates and regulates the flow of information and knowledge. Wells et. al. (2019) did an investigation on 130 students enrolled in animal science courses and found that offline learning along with practicals are beneficial, the students increased their knowledge from traditional classroom lecture 33% and an additional 14% after a hands-on laboratory (Wells et. al., 2019). Traditional learning has its disadvantages as well, it is found to be teacher controlled, leads to fewer decision-making opportunities, students feel less efficacious and also suffers between-classroom ability grouping (Eccles et.al., 1993). Offline learning allows students to practice and apply tasks in real-world scenarios, but the activity can be time consuming and expensive.

Online learning is defined as “learning experiences in synchronous or asynchronous environments using different devices (e.g., mobile phones, laptops, etc.) with internet access. In these environments, students can be anywhere (independent) to learn and interact with instructors and other students” (Singh & Thurman, 2019). After the onset of current pandemic COVID-19, online classes had suddenly emerged as essential in the field of education. Researchers found that this sudden shift to online mode of education has created chaos among students and led to several mental health issues such as stress, anxiety, depression among them (Fawaz and Samaha, 2020; Cao et. al. 2020; Islam et. al. 2020; Syed, 2021). During the recent pandemic Chakraborty et. al. (2020) conducted a survey on 358 undergraduate students at an Indian university to find out their opinions on various aspects of online learning mode and found that the students felt that online education is useful right now (77.9%) however, it is also stressful and affecting their health and social life (Chakraborty et. al. 2020). Online learning system carried out during the COVID-19 pandemic is effective because of the conditions that require online study and inefficient because the costs incurred more when compared with offline lectures; reduced interactions with teachers and peers, decreased practical application etc (Bahasoan et. al., 2020).

Both the modes of education have their pros and cons- offline mode of education provides exposure, more social and physical interaction, more practical applications, less screen time whereas online mode can be termed as a tool that can make the teaching–learning process more student-centred, more innovative, and even more flexible (Lindsey & Rice, 2015; Hass & Joseph, 2018; Dr. Elfaki et. al. 2019). Before the onset of COVID 19, the education system was generally following the offline traditional mode of education but following this pandemic, it was forced to shift to online mode of education globally. In an survey analysis conducted by Gupta, (2020) on post graduate students to compare their perception towards online versus offline mode of learning during the current pandemic and found that online learning is better over offline learning in terms of its convenience, accessibility and flexibility whereas offline learning is preferred by students over online learning in case of teacher-student interaction, doubt clarity and better evaluation of the students’ performance (Gupta, 2021), Researchers pointed that during current pandemic online learning cannot produce desired results like offline learning due to technical as well as financial issues. the absence of traditional classroom networking, reaction time, and face-to-face engagement with the teacher (Adnan and Anwar, 2020) and also students felt that they learn better in physical classrooms (65.9%) than through online education (Chakraborty, et. al., 2020). However, On the other hand, some researchers have found that student final exam scores by the online learning group is statistically significantly higher than those for the offline learning group and also students' attitudes was significant in favour of the online learning group (Dr. Elfaki et. al., 2019).

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From July 2021, The Karnataka government has allowed educational institutions to resume back offline classes in their premises after following required precautions for COVID-19. Some went on to offline classes in college, while others continued with their online classes thus, current study aims to bring forth the comparative analysis of both the modes of education and their impact on the levels of academic stress and states of mental wellbeing of the students amidst pandemic. The study looked at three specific objectives and their four corresponding hypotheses. The first objective was to study the difference between both the modes of education with respect to the levels of academic stress among students amidst pandemic and the corresponding hypothesis was,

H₁: There will be a significant difference in the levels of academic stress in both the modes of education amidst pandemic.

The second objective was to study the impact of both the modes of education on the states of mental wellbeing of the students amidst current pandemic and the corresponding hypothesis was, *H₂: There will be a significant difference in the states of mental wellbeing of the students in different modes of education amidst pandemic.*

The third objective was to study the combined interactional effect of modes of education on academic stress and mental wellbeing of the students, keeping one constant at a time amidst the current pandemic and it will lead to two corresponding hypotheses,

H₃: A combination of modes of education and levels of academic stress will have a significant impact on the mental wellbeing of the students amidst pandemic.

H₄: A combination of modes of education and states of mental wellbeing of the students will have a significant impact on the academic stress of the students amidst pandemic.

METHODS

The current study used a quantitative and non-experimental research design which lay emphasis on modes of education as predictor variable whilst academic stress and mental wellbeing of the students amidst pandemic were treated as criterion variable. The sample consists of 100 students aged 19-25 yrs., who are enrolled in full-time undergraduate courses in different colleges of Bengaluru, India. The study has undertaken non-random sampling techniques such as convenience and snowball sampling. An informed consent sheet and the socio-demographic sheet-including the participant's age, gender, location, class and modes of education was prepared [refer Appendix A]. The current study used Perceptions of Academic Stress Scale (PASS) by Dalia Bedewy and Adel Gabriel (2015) (Bedewy, Dalia and Gabriel, 2015) [refer Appendix B] and Warwick-Edinburg Mental Well-being Scale (2008) (Warwick and Edinburgh, 2008) [refer Appendix C] to access the variables. The data was collected online through Google Forms, a questionnaire was constructed for the purpose which includes the informed consent, sociodemographic sheet followed by both the scales (refer Appendix-A, B & C). The collected data was scored and interpreted based on the norms specified. The data obtained was analysed by using two-way ANOVA to study the impact of modes of education on academic stress and mental well-being of the students amidst pandemic.

RESULTS

The analysis of the socio-demographic variables indicates that the sample consisted of 100 undergraduate students (50 from each mode of learning- offline and online), including males (45%) and females (55%) in the age group 19-25 years (M=1.55; SD=0.50), enrolled in full-time undergraduate course in various colleges of Bengaluru, India. Descriptive Analysis of the sample (N=100) shows that the mean score of the perceived academic stress among students taking online classes is found to be (N=50; M= 59.22; SD= 9.23) and the mean

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score of the perceived academic stress among students taking offline classes in colleges is found to be (N=50; M= 58.12; SD= 9.40), which indicates that students are experiencing above average level of academic stress during both the modes of education but online mode of learning is showing a slightly higher levels of academic stress as compared to offline mode of learning (MD= 1.1) which can be attributed to no social and physical contact with teachers and peers, increased screen time, technical and internet glitches, no access to practical applications etc. (Refer Table-1).

Table-1 showing descriptive statistics for academic stress variables for students taking online and offline classes in college

Academic Stress	Modes of Education	N	Mean	Std. Deviation	Std. Error Mean
	Online	50	59.22	9.232	1.306
	offline in college	50	58.12	9.408	1.331

In order to further compare the levels of academic stress among students taking online classes versus students taking offline classes in colleges, Independent sample t-test was employed. Results shows that for students taking online classes versus students taking offline classes in colleges df= 98; t= 0.590; p> 0.05 is significant. (refer Table-2).

Table 2: Showing the results of Independent sample t-test of academic stress among students taking classes online and offline in college

Therefore, hypothesis H_1 : *There will be a significant difference in levels of academic stress in both the modes of education amidst pandemic* is accepted indicating that there is a significant difference in the levels of academic stress experienced by students taking online classes as compared to those who are taking offline classes in college.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Academic Stress	Equal variances assumed	.082	.775	.590	98	.556	1.100	1.864	-2.599	4.799
	Equal variances not assumed			.590	97.96	.556	1.100	1.864	-2.599	4.799

Descriptive Analysis of the sample (N=100) shows that the mean score of the mental wellbeing of students taking online classes is found to be (N = 50; M= 50.04; SD=10.88), which indicates that students taking online classes have average level of mental wellbeing whereas the mean score of the mental wellbeing of the students taking offline classes in

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colleges is found to be (N=50; M= 44.86; SD=11.256), which indicates that students taking offline classes in colleges are experiencing low level of mental wellbeing[Refer Table-3].

Table-3 showing descriptive statistics for mental wellbeing variable of students taking online and offline classes in college:

	Modes of Education	N	Mean	Std. Deviation	Std. Error Mean
Mental Wellbeing	Online	50	50.04	10.880	1.539
	offline in college	50	44.86	11.256	1.592

Similarly, for further comparing the states of mental wellbeing among students taking online classes versus students taking offline classes in colleges again, Independent sample t-test was employed. Result shows that for students taking online classes versus students taking offline classes in colleges df= 98; t=2.340; p>0.05 is significant (refer Table- 4).

Table 4: Showing the results of Independent sample t-test of mental wellbeing among students taking classes online and offline in college

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Mental Wellbeing	Equal variances assumed	.367	.546	2.340	98	.021	5.180	2.214	.787	9.573
	Equal variances not assumed			2.340	97.98	.021	5.180	2.214	.787	9.573

Therefore, hypothesis H_2 : *There will be a significant difference in mental wellbeing of the students in different modes of education amidst pandemic* is accepted indicating that there is a significant difference in the states of mental wellbeing of students taking online classes which is higher than those taking offline classes in the colleges, which can be attributed to the fears of the pandemic that they face while travelling to college and because of increased social and physical proximity.

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Then multiple regression analysis was performed to establish the combined interactional effect of modes of education with the criterion variables- academic stress and mental wellbeing, was determined, one at a time, whilst the other was held constant. First, the combined impact of modes of education and levels of academic stress on the states of mental wellbeing of the students amidst the current pandemic was analysed. Multiple regression analysis reflects that the modes of education and academic stress together predicted 5.3 % of the variation in the mental wellbeing ($R^2= 0.053$) of the students. The predictor variable, modes of education is found to be significant negatively related to the mental wellbeing of the students ($\beta= -.229$, $t= -2.31$, $p>0.05$), which means that change in modes of education from online to offline has leads to the deterioration in mental wellbeing of the students by 0.22 (refer Table 5).

Table 5: Regression analyses of modes of education and levels of academic stress onto the mental wellbeing of the students amidst pandemic

Model	Un-standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	54.119	8.079		6.699	.000
Academic stress	.018	.121	.015	.151	.880
Mode of Education	-5.160	2.229	-.229	-2.315	.023

$R^2= 0.053$; $F= 2.721$; $p<0.05$

Predictors: (Constant) Modes of education, Academic Stress

Dependent Variable: Mental Wellbeing

Therefore, hypothesis H_3 : *A combination of modes of education and levels of academic stress will have a significant impact on the mental wellbeing of the students amidst pandemic* is accepted indicating that a combination of modes of education along with academic stress has a significant impact on the mental wellbeing of the students amidst current pandemic but this impact is low (5.3%).

Then again multiple regression analysis was performed to establish the combined effect of modes of education and states of mental wellbeing of the students on the academic stress of the students amidst the current pandemic. Multiple regression analysis reflects that modes of education and states of mental wellbeing together predicted 1.4 % of the variation in the levels of academic stress ($R^2=0.014$) of the students. The predictor variable modes of education is found to be significant negatively related to the academic stress of the students ($\beta= -.078$, $t= -.750$, $p>0.05$), which means that change in modes of education from online to offline has led to the decrease in the levels of academic stress experienced of the students by 0.078 (refer Table 6).

Table 6: Regression analyses of modes of education and state of mental wellbeing onto the levels of academic stress of the students amidst pandemic

Model	Un-standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	60.422	5.569		10.849	.000
Mental Wellbeing	.009	.085	.011	.105	.917
Mode of Education	-1.442	1.922	-.078	-.750	.455

$R^2= 0.014$; $F= 0.321$; $p>0.05$

a. Predictors: (Constant) Modes of education, Mental Wellbeing

b. Dependent Variable: Academic Stress

Therefore, hypothesis *H₄*: *A combination of modes of education and states of mental wellbeing of the students will have significant impact on the levels of academic stress of the students amidst pandemic* is accepted indicating that a combination of modes of education along with states of mental wellbeing has a significant impact on the levels of academic stress of the students amidst pandemic but this impact is quite low (1.4%).

DISCUSSION

The comparison of both the modes of education- online and offline learning, was always under discussion (Lindsey & Rice, 2015; Hass & Joseph, 2018; Dr. Elfaki et. al., 2019). Following the abrupt transformation in educational modalities during the current pandemic, various researchers highlighted the benefits as well as drawbacks of both the modes of education along with their contrasts. (et. al., 2020; Dr. Elfaki et. al., 2019; Gupta, 2021; Adnan and Anwar,2020). In order to return to normalcy after the "second wave" of current pandemic, the Karnataka government issued a circular instructing colleges to conduct offline classes in accordance with COVID-19 standards or to continue with online lessons, whichever is more convenient. This study aims to do the comparative analysis of both the modes of education- online versus offline and their impact on academic stress and mental wellbeing of the students amidst the pandemic. In consistent with the previous researches, the empirical findings of the current study also found that the levels of academic stress is found to be a bit higher in online classes as compared to offline classes which can be attributed to no social contact with teachers and peers, increased screen time, internet and technical glitches, no practical accessibility etc. In contrast, mental wellbeing is found to be low in students attending offline classes in colleges owing to the enhanced fears of the pandemic due to travelling, increased social and physical proximities etc. The combined interactional effect of modes of education and academic stress on the mental wellbeing of the students is found to be low (5.3%) whilst combined interactional effect of modes of education and states of mental wellbeing on the academic stress is found to be quite low (1.4%). Also, the predictor variable modes of education's transformation back to offline from online, has not only reduced the academic stress experienced by the students but also led to the deterioration in their states of mental wellbeing. Students are less stressed academically as a result of greater academic help, increased interactions with professors and peers, but at the same time they are also facing a constant threat of illness and death from the pandemic because of increased social and physical proximities and travelling, which is deteriorating their mental health.

Limitations and Directions for Future Research

The current study has few limitations; the sample comprises of students enrolled in various courses (arts, commerce, science etc.) and from all three academic levels (first, second, and third year) of under graduate module from various colleges of Bengaluru, India. The educational course presented and the academic levels of the students have an impact on the effectiveness of the modes of learning as well as on the criterion variables-academic stress and mental well-being. This should be taken into account in future studies involving students from the same educational stream and academic level, as well as colleges from other cities in India or around the globe. Comparative analysis of the modes of education can be done with different variables and different samples such as post graduate students, primary and secondary school students etc. The variables employed can be studied through other psychometric devices to confirm and establish the direction of the results obtained in the present investigation.

Implications of the study

The present study contributes to the understanding of the effectiveness of the various modes of education and their impact on the levels of academic stress and mental wellbeing of the students amidst the pandemic, COVID-19. The empirical findings shows that the academic stress in online mode of learning in the pandemic is a bit higher as compared to offline mode of learning in the college; whereas mental wellbeing is found to be lower in the students heading to colleges for classes than those taking classes online. After almost two years of COVID-19, we still can't say that online learning is more effective than traditional offline learning or vice versa amidst the pandemic, it certainly depends on the course of study and academic levels of the students.

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Conflict of Interest

The author declared no conflict of interest.

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