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The Impact of Students' Perceptions of Online Learning Environments on Students' Satisfaction in the Context of COVID-19 Pandemic

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ABSTRACT

In the context of the Covid-19 pandemic, the present study aimed to examine students' perceptions of online learning environments and students' satisfaction based on their academic stream. The study also investigated the impact of students' perceptions of online learning environments on students' satisfaction. A quantitative descriptive survey method was applied. This study included 230 students (130 undergraduate and 100 postgraduate students) from colleges and universities of West Bengal. Online Learning Environments Survey, an adapted and translated (Bengali) version of the Distance Education Learning Environments Survey (DELES) by Scott L Walker (2003), was used for collecting data. For data analysis, statistical techniques, ANOVA, and regression analysis were performed. The results revealed significant mean differences among arts, commerce, and science students' perceptions of online learning environments in the dimensions of student interaction and collaboration, personal relevance, authentic learning, active learning, and student autonomy except in instructor support. Furthermore, a significant mean difference in student satisfaction was found based on the academic stream. The result revealed that overall students' perceptions of online learning environments had a significant impact on student satisfaction, with student interaction and collaboration being the most significant predictor of all; however, instructor support, active learning, and student autonomy were not found to be significant predictors of student satisfaction.

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INTRODUCTION

The sudden emergence of the Covid-19 pandemic forced many countries to implement lockdown to flatten the curve of the lethal virus (Kamble et al., 2021). This wreaked havoc on every sector of life including education sector. The pandemic took a toll on the education system with unprecedented challenges. It has shaken the education sector globally (Dhawan, 2020). All educational institutions were compelled to close their doors for face-to-face teaching and learning to prevent the transmission of the virus. It has caused severe disruption of education systems, affecting approximately 1.6 billion students across more than 190 countries (United Nations, 2020). In this time of turbulence when face-to-face teaching and learning was not feasible, emergency remote learning was the only way to ensure continued teaching and learning (Hussein et al., 2020; Tang et al., 2021). Educational institutions shifted from the traditional model of teaching and learning to the online mode of teaching and learning (Biwer et al., 2021; Patricia, 2020). Online learning refers to learning experiences that take place through the use of technology (Moore et al., 2011). Online learning has acquired popularity in the field of education (Baber, 2020); however, earlier it was considered only as a part of non-formal

education (Mishra et al., 2020). The pandemic has increased the pace of online learning. With this emergent transition to the online mode of teaching and learning, students experience entirely different learning experiences (Adnan & Anwar, 2020) as there is a difference between the nature of traditional and online learning environments (Trinidad et al., 2005). Bignoux & Sund (2018) stated that the online learning environment varied profoundly from the traditional learning environments in terms of students' motivation, satisfaction, and interaction.

Over the past few decades, studies showed the significance of the learning environment in the process of teaching and learning. Learning environment refers to "the social, physical, psychological and pedagogical context in which learning occurs and which affects student achievement and attitudes (Fraser, 2012). Physical, social, and organizational environments in which teaching and learning processes take place have a pivotal role (Unesco, 2012). The learning environment is a significant predictor of student performance (Duruji et al., 2014; Shamaki, 2015), academic interest (Ezike, 2018), academic self-efficacy (Daemi et al., 2017). Students' perceptions of the psychological characteristics of their classroom influence students' cognitive and affective learning outcomes (Fraser, 1998). "Good learning environments foster quality learning, and bad learning environments do not" (Unesco, 2012, p.9).

Student satisfaction refers to a "short-term attitude resulting from an evaluation of a students' educational experience" (Elliott & Healy, 2001, p.2). The quality of learning experiences is determined by student satisfaction (Kuo et al., 2013).Satisfaction influences student motivation (Bolliger & Martindale, 2004); persistence and retention (Sembiring, 2015). Learner satisfaction is positively correlated with the quality of learning outcome (Palmer & Holt, 2009); students' success in learning (Muzammil et al., 2020). Students with a high level of satisfaction performed better academically than students with a low level of satisfaction (Martirosyan, 2014). Student satisfaction is crucial in the adaption of online learning (Zhu, 2012).

India like many countries imposed a nationwide lockdown from March 25, 2020 first for 21days and later extended to 31st May 2020 to limit the spread of deadly coronavirus (Kamble et al., 2021). Before that, the Government of West Bengal announced the closure of all educational institutions on 14th March 2020 as educational institutions were viewed as the potential hotspots for the spread of coronavirus. Colleges and universities quickly shifted to online teaching and learning as per the guidelines of the University Grants Commission. In West Bengal, more than a year has been passed since students adopted online learning; hence, it is necessary to understand how students perceive online learning environments and the factors influencing students' satisfaction in online learning environments to foster student success and academic performance. Quality enhancement of online teaching and learning is crucial (Dhawan, 2020). Students' perceptions and satisfaction need to be examined as these determine the quality of learning outcomes. This study aimed to examine the impact of students' perceptions of online learning environments on students' satisfaction in the context of the COVID-19 pandemic.

Literature Review

Abbasi et al. (2020) conducted a study on 382 MBBS and BDS students from a medical college to examine the perceptions of students towards e-learning during the lockdown. The result revealed that students preferred face-to-face teaching and learning to e-teaching during the lockdown amid the COVID-19 pandemic.

Adnan & Anwar (2020) in a study on 126 higher education students from Pakistan reported that traditional classroom learning was more effective and motivating than online learning or distance education. The study showed that online learning could not produce effective outcomes in underdeveloped nations, where the majority of students lack access to the internet because of technical and financial constraints.

Ansar et al. (2020) in a study conducted on 600 students of medical, engineering, and art from universities of Pakistan reported that the majority of the students were not satisfied with

online learning. Students preferred classroom teaching and did not want to continue with e-learning.

Baber (2020) in a study conducted on 100 undergraduate students from South Korea and India reported that the factors that had an impact on students' perception of learning outcome and student satisfaction were classroom interaction, student motivation, course structure, instructor knowledge, and facilitation. The results showed no significant difference in the students' perceived learning outcome and student satisfaction in the two countries.

Syauqi et al. (2020) conducted a study on 58 students from Indonesia to examine students' perceptions of Mechanical Engineering Education on online learning as a result of the impact of the Covid-19 pandemic. The results indicated that teachers' management with online learning did not satisfy students' expectations. Students felt that online learning could not provide better experience or productivity in mastering competencies, but might bring motivation and ease in their learning; however, they were unwilling to use it in the future.

Alqurashi (2017) in a study of 167 undergraduate and graduate students from a university of Western Pennsylvania concluded that all four predictor variables of the learning environment (online learning self-efficacy, learner-content interaction, learner-instructor interaction, and learner-learner interaction) impacted students' satisfaction and perceived learning. The study reported that interaction between learner and content was the most significant factor influencing student satisfaction; however, the interaction between learner and learner was not a significant predictor of student satisfaction and perceived learning.

Carver (2014) in a study on 745 high school students from the USA revealed that students perceived online learning to be more beneficial than face to face learning in terms of active learning and autonomy; though they preferred face to face learning to online teaching and learning in terms of student interaction and collaboration and enjoyment.

Kuo et al. (2013) found that interaction between learner and instructor, the interaction between learner and content, and internet self-efficacy were significant determinants of student satisfaction; however, the interaction between learner and learner and self-regulated learning had no impact on students satisfaction.

Velayutham et al. (2013) in a study of 352 college students from the United Arab Emirates reported that two aspects of learning environments namely teacher support and personal relevance were significant predictors of students' enjoyment of mathematics lessons and academic self-efficacy.

Sahin (2007) in a study of 970 undergraduate students from Turkey reported that four dimensions of learning environments that had a significant and positive relation to student satisfaction were personal relevance, instructor support, active learning, and authentic learning.

Trinidad et al. (2005) in a study of 325 students from Australia and Hong Kong reported that overall instructors perceived learning environments more preferably than their students. The results also indicated a statistically significant association between the e-learning environment and student enjoyment.

Significance of the Study

A significant body of research has been conducted on the learning environment and student satisfaction; however, studies on the online learning environment and students' satisfaction in the online learning environment are very limited in India, particularly in West Bengal. Moreover, previous studies were conducted on the learning environment, mostly on the traditional classroom learning environment. In the context of the COVID-19 pandemic, the present study examined the impact of students' perceptions of online learning environments on student satisfaction in West Bengal, as a new online learning environment has emerged as a result of the current pandemic situation, and many researchers opine that this online teaching and learning will eventually replace traditional teaching and learning if the situation persists (Mishra et al., 2020). Further, very few studies addressed students' perceptions and satisfaction

with the online learning environment based on their academic stream. This study examined the students' perceptions of online learning environments and students' satisfaction with online learning environments based on the academic stream. The findings of the present study will contribute to and extend previous literature related to the learning environment and the impact of the learning environment on student satisfaction. This study is significant as it provides educators and policymakers with insights on how to improve the quality of online learning environments, which is dependent on students' perception and satisfaction. Understanding the predictors of student satisfaction in the new online learning environments is crucial as this will help the educators, administrators to design content, apply effective techniques, and implement teaching strategies so that students may succeed in online learning.

RESEARCH METHOD

A quantitative descriptive survey method was used in this study.

Objectives

The objectives of this study were:

1. To find out the significant mean difference among arts, commerce, and science students' perceptions of online learning environments.
2. To find out the significant mean difference among arts, commerce, and science students' satisfaction.
3. To study the impact of students' perceptions of online learning environments on students' satisfaction.

Hypotheses

The following hypotheses were formed based on the objectives of the study:

H01. There was no significant mean difference among arts, commerce, and science students' perceptions of online learning environments.

H02. There was no significant mean difference among arts, commerce, and science students' satisfaction.

H03. There was no impact of students' perceptions of online learning environments on students' satisfaction.

Population & Sample

The population of the study consisted of undergraduate and postgraduate students from government and government-aided colleges and universities of West Bengal. The sample of the study was 230 students including 100 postgraduate and 130 undergraduate students studying at the government and government-aided colleges and universities of West Bengal. A random sampling technique was used to select the participants for the study.

Tool and Procedure of Data Collection

Google forms were sent to the students through WhatsApp and e-mail for conducting an online survey. The Online Learning Environments Survey, an adapted and translated version (Bengali) of the Distance Education Learning Environment Survey by Scott El Walker, 2003, was used to collect data. The present scale consisted of 56 items. Online learning Environments Survey includes 6 sub-scales measuring students' perceptions of the online learning environment, namely, instructor support, student interaction and collaboration, personal relevance, authentic learning, active learning, and student autonomy. An added effective scale of the Online Learning Environments Survey is student satisfaction.

Statistical Analysis

For analysing the data ANOVA and regression analysis were conducted using IBM SPSS.

RESULTS AND DISCUSSION

H01. There was no significant mean difference among arts, commerce, and science students' perceptions of online learning environments.

Table 1. Results of ANOVA for arts, commerce, and science students' perceptions of online learning environments

Scales of online learning environment survey	Stream	N	Mean	SD		df	F	Sig
Instructor Support	Arts	108	41.54	4.335	Between Groups	2	1.676	0.189
	Commerce	48	41.38	4.579	Within Groups	227		
	Science	74	40.35	4.455	Total	229		
Student interaction and collaboration	Arts	108	28.14	5.610	Between Groups	2	4.153	0.017
	Commerce	48	27.56	5.214	Within Groups	227		
	Science	74	25.58	6.855	Total	229		
Personal Relevance	Arts	108	26.80	6.418	Between Groups	2	7.137	0.001
	Commerce	48	26.33	5.762	Within Groups	227		
	Science	74	23.42	5.850	Total	229		
Authentic Learning	Arts	108	29.06	5.173	Between Groups	2	12.571	0.000
	Commerce	48	27.79	5.194	Within Groups	227		
	Science	74	24.93	5.934	Total	229		
Active Learning	Arts	108	33.21	5.099	Between Groups	2	3.481	0.032
	Commerce	48	32.79	4.993	Within Groups	227		
	Science	74	31.20	5.268	Total	229		
Student Autonomy	Arts	108	41.66	7.158	Between Groups	2	5.273	0.006
	Commerce	48	41.46	5.903	Within Groups	227		
	Science	74	38.55	6.383	Total	229		

Table 1 showed that obtained p-value was less than the .05 level of significance in all the dimensions of online learning environments survey, namely, student interaction and collaboration(F= 4.153, p value= 0.017); personal relevance(F= 7.137, p value= 0.001);authentic learning(F= 12.571, p value= 0.000) active learning(F= 3.481, p value= 0.032); student autonomy(F= 5.273, p value= 0.006) except in one dimension, instructor support (F= 1.676, p value= 0.189). It indicated that there was a significant difference among arts, commerce, and science students' perceptions of online learning environments in all sub-scales except in the sub-scale of instructor support; hence, the null hypothesis, "there was no significant mean difference among arts, commerce and science students' perceptions of online learning environments", was partially rejected. The mean difference indicated that the students of arts

had the best experiences with online learning environments among the three groups of students.

H02. There was no significant mean difference among arts, commerce, and science students' satisfaction.

Table 2. Results of ANOVA for arts, commerce, and science students' satisfaction

Descriptives					ANOVA			
Variable	**Academic Stream**	**N**	**Mean**	**SD**		**df**	**F**	**Sig.**
Student Satisfaction	Arts	108	29.21	8.840	Between Groups	2	42.240	0.000
	Commerce	48	26.83	6.231	Within Groups	227		
	Science	74	18.91	6.064	Total	229		
	Total	230	25.40	8.782				

From table 2, it was found that obtained p-value was less than the 0.01 level of significance in the sub-scale of student satisfaction (F= 42.240 and p-value= 0.000). This indicated that there was a significant mean difference among arts, commerce, and science students' level of satisfaction. Hence, the null hypothesis, "there was no significant mean difference among arts, commerce and science students' satisfaction." was not accepted. The result signified that art students scored the highest and science students scored the lowest in their level of satisfaction with online learning environments.

H03. There was no impact of students' perceptions of online learning environments on students' satisfaction.

Table 3. Model summary for regression analysis

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.555[a]	0.307	0.289	7.406

Table 3 showed that the r-value was .555 that indicated a medium degree of positive correlation between students' perceptions of online learning environments and students' satisfaction. The value of R^2 was 0.307, which indicated that students' perceptions of online learning environments could account for 30.7% of the variation in students' satisfaction.

Table 4. ANOVA test of students' perception of online learning environments on student satisfaction

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5430.494	6	905.082	16.502	.000[b]
	Residual	12230.706	223	54.846		
	Total	17661.200	229			

a. Dependent Variable: Student Satisfaction.
b. Predictors: (Constant), Student Autonomy, Instructor Support, Student interaction and Collaboration, Personal Relevance, Active Learning, Authentic Learning.

Table 5 reports the overall effect of students' perceptions of online learning environments on student satisfaction. Here, F is 16.502, which is significant at $p < .001$ (because the value in

the column labeled Sig. is less than .001). This result indicated that overall effect of students' perceptions of online learning environment on student satisfaction is significant.

Table 5. The regression coefficient for students' perception of online learning environments and student satisfaction

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.246	5.307		-0.423	0.672
	Instructor Support	0.038	0.133	0.018	0.287	0.775
	Student interaction and Collaboration	0.290	0.118	0.200	2.459	0.015
	Personal Relevance	0.250	0.121	0.178	2.073	0.039
	Authentic Learning	0.286	0.142	0.186	2.023	0.044
	Active Learning	0.026	0.153	0.015	0.171	0.864
	Student Autonomy	0.075	0.119	0.058	0.63	0.530

a. Dependent Variable: Student satisfaction

Table 5 showed that, in the present model, the unstandardized Beta-values (b) were significant for student interaction and collaboration, personal relevance, and authentic learning; unstandardized beta values for instructor support, active learning, and student autonomy are not significant. The unstandardized beta values indicate that if student interaction and collaboration increase one unit student satisfaction increases by .290 units. For personal relevance, student satisfaction increases by .250 units and for authentic learning, student satisfaction increases by .286 units. Student interaction and collaboration were found to have the highest predictive value (0.200).

The findings showed that there was a significant difference among arts, commerce, and science students' perceptions of online learning environments in all sub-scales of the Online Learning Environments Survey, namely, student interaction and collaboration, personal relevance, authentic learning, active learning, student autonomy, except in one scale, i.e., instructor support. Students of arts perceived their online learning environments the best during the pandemic situation followed by students of commerce and students of science. There might be many reasons causing the differences among students' perceptions of online learning environments based on the academic stream. One reason could be that practical experiments and simulations needed for a deep understanding of science concepts were not performed in the online classroom (Nsengimana et al., 2021). Also, knowledge construction through collaborative learning that was an effective method of science learning was limited in the online classroom (Nsengimana et al., 2021). Science students may have problems grasping the concepts virtually. However, students did not differ in their perceptions of instructor support, this

indicated that students felt that their instructors were supportive, gave prompt feedback, encouraged participation, and could be contacted easily.

The results of the study, further, revealed significant differences among arts, commerce, and science students' satisfaction with online learning environments. The students of science were least satisfied and students of arts were most satisfied with online learning environments among all groups of students. The reason might be the fact that practical experiments, demonstrations, laboratory activities, field trips that are required for science teaching and learning were not performed in the online learning classes (Nsengimana et al., 2021). Another reason could be that science students preferred face-to-face teaching and learning to online teaching and learning (Abbasi et al., 2020; Adnan & Anwar, 2020; Patricia, 2020) and was reluctant to use online learning in the future (Syauqi et al., 2020).

The findings of the study also revealed that overall, students' perceptions of online learning environments had a significant impact on students' satisfaction; however, the dimensions-student interaction and collaboration, personal relevance, and authentic learning were significant predictors of students' satisfaction; three sub-scales, instructor support, active learning, and student autonomy did not predict students' satisfaction. The strongest predictor of student satisfaction was found to be student interaction and collaboration. This signifies that students who have opportunities to interact with their peers, share ideas and information and collaborate are more satisfied in online learning environments. This finding is in line with the findings of previous studies like Baber (2020), Sher (2009) who reported that student interaction fostered student satisfaction. In the present study, personal relevance was found to be another significant predictor of student satisfaction. This suggests that in online learning environments, students who have opportunities to integrate academic content with personal experiences are more satisfied. This finding is consistent with the findings of Sahin (2007) who reported that personal relevance was the strongest predictor of student satisfaction. The present study found that another significant predictor of satisfaction was authentic learning. This indicates that in online learning environments, students become highly satisfied when they can solve real-life examples, facts. This finding is in line with the findings of Sahin (2007) and Noreen et al.(2019) who reported that authentic learning enhanced students' satisfaction. The results of the present study, however, differed from the previous studies. For example, Sahin (2007) reported that instructor support and active learning were predictors of student satisfaction; Bolliger & Martindale (2004) found that instructor variables were the most important factor influencing student satisfaction in the online learning environment.

Limitation and Future Research

The present study has many limitations. First, only students of general courses of colleges and universities of West Bengal participated in the study. Further studies can be done on the perceptions of online learning environments of students pursuing engineering, vocational, medical courses. Secondly, a descriptive survey design was used in this study. Mixed method research can be done for in-depth exploration and understanding of students' perceptions of online learning environments and students' level of satisfaction. Third, the present study was done only on 230 students (100 undergraduate and 130 postgraduate students). Future studies can be conducted on a large sample of students, also on students of secondary and higher secondary level.

CONCLUSION

Online learning was not as prevalent as it is in the post-COVID era. The emergence of the pandemic has brought a seismic transformation in the field of education as educational institutions switched to digital platforms from the four walls of the classroom to ensure incessant education. It is overwhelmingly possible that online teaching-learning will continue in the coming years as there is uncertainty looming large over the resumption of classes as wave

after wave of COVID-19 virus engulfs our country. In this context, the present study aimed to investigate students' perceptions of online learning environments as well as their satisfaction based on the academic stream. The study also examined the impact of students' perceptions of online learning environments on students' satisfaction. The findings showed except in instructor support, there existed a significant difference in students' perceptions of online learning environments. Further, a significant difference in their satisfaction with online learning environments based on the academic stream was found. The students of arts scored the highest while the students of science scored the lowest in their perceptions of online learning environments and satisfaction in online learning environments. Further, the results showed that overall students' perceptions of online learning environments had a significant impact on students' satisfaction. The findings of the present study have various suggestions for the stakeholders to improve the quality of online learning environments and enhance students' satisfaction. Instructors should provide information; give assessments that are related to students' out-of-class experiences. Activities including collaboration, group assignments should be provided. Students should have opportunities to interact among themselves, solve real-world problems in the online learning environment.

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