The Impact of COVID-19 Pandemic on Students' Academic Performance of: The Case of Hope Enterprise University College, *Behailu Abebe*

Abstract

COVID-19 brought worldwide crises to all levels of education and Ethiopia is not an exception. This research was conducted on the teaching-learning process of HEUC to learn from the experiences of a sudden shutdown of regular classes and a shift into e-learning platforms during the pandemic. The assessment was conducted looking into the perspectives of students involving survey interviews, comparison of grade-based assessments between online and face-to-face classes, observations, and informal interviews with students and instructors. A random sample of 106 students participated in the research in addition to comparing grades of 512 first-year undergraduate students and 181 graduate students in the online and face-to-face classes. Some of the locally validated instruments named "Model for E-Learning Systems Success" was used for the survey adding an open question section to collect the perspectives of students. The results of the study showed that students generally had a negative view of online learning. They reported feeling isolated and disconnected from their teachers and classmates. They also found it difficult to stay motivated and focused on their studies. The findings of this study suggest that the COVID-19 pandemic has had a negative impact on education in Ethiopia. Students and teachers have struggled to adapt to online learning, and this has led to a decline in academic performance. One way to address these challenges is to provide students with more support and resources. This could include offering tutoring, counseling, and other forms of support. In addition, this could include providing more interactive and engaging content, as well as making sure that the platforms are user-friendly. Finally, it is important to provide teachers with training on how to teach effectively online.

Keywords: COVID-19 Pandemic, Higher Education, E-Learning System, E-Learning Platform

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Introduction

This study has been conducted on the performance of students who used online learning following the shutdown of schools and Higher Education Institutions in Ethiopia on March 16, 2020. The pandemic quickly spread all over the world including Africa. Other than in China, by March 20th of 2020, there were more than 769 confirmed cases of coronavirus in 37 nations across African countries causing them to take preventive measures by shutting down social gatherings including schools and universities (Joseph Paschal & Mkulu, 2020).

Like other developing countries, Ethiopia neither had the necessary adequate resources to support continuing education online nor has it been prepared for this service (Ministry of Education, 2020). After the two weeks closure was extended for five months by the State of Emergency declared by the FDRE, the ICT Office of HEUC prepared a short-term training for instructors in April 2020 on how to use Google Classroom for online learning. Correspondingly, following the shutdown of schools and HEI, MoSHE gave directives so

that students continued learning online using available social media and online resources. Thus, some form of online support and monitoring had been developed.

Even within the well-prepared modality of online learning, online modality had more issues and was not as effective as face-to-face classroom settings (Joynes et al., 2020). As regards, this study hypothesized that COVID-19 would negatively impact the performance of students that were active through online learning during the pandemic. The low levels of technology use in University students in Ethiopia due to limited technology resources signified a very difficult period ahead not disregarding issues related to equitable use of these limited resources across different vulnerable groups such as sponsored and female students.

Despite all the challenges, COVID-19 created an upsurge in using e-learning platforms to continue education during the lockdown. The system was useful as instructors delivered their course materials even continuous assessments like projects, assignments, and quizzes to their students online or offline (Chen & Ayenew, 2021). This model transformed, at least during the lockdown, teacher-centered and lecture-based

learning into student-focused activities such as group discussions and hands-on experiences by eliminating the dependency on lectures (Rudrapati et al., 2021).

The study assessed the performance of students using online platforms by comparing students' grades of online assessments with that of face-to-face classes exams. The study involved the use of survey questionnaires and interviews with 120 randomly selected students. In addition to this, the study used the grade results of the last semester of the 2020 academic year to compare those with future grades after the shutdown. The study used a variety of ways to qualitatively assess the use of online resources focusing on sequentially ordered content, interaction and feedback to students, and assessment modalities of instructors teaching different courses and engagement of students in learning. The study commented on the part of teaching that needs to be addressed when HEUC resumed regular lessons on how to blend classroom teaching with online learning in the future.

Problem Statement

Even in the well-prepared context in the USA, online learning is less effective than face-to-face classroom teaching. (McAleavy and Gorgen, 2020). A similar study carried out in the Philippines found that university students are not ready for online learning and institutions have to enhance instructional delivery to ensure the quality of learning (Pastor, 2020). Lack of preparedness and poor infrastructure was cited as major challenge to cushioning the effect of COVID-19 on education in Nigeria (Abba, 2020). The infrastructure has also been \ poor in sub-Saharan Africa that making an adaptation of e-learning learning the same as "challenge-ridden online learning" (Adarkwah, 2021).

Likewise, the COVID-19 closure in Ethiopia forced all education to move on to e-learning platforms without the necessary preparations of resources. Mengistie (2021) argued that since large sections of students had the least technology support, without government and university support we may create a lost generation in the COVID-19 pandemic period. It is believed that students need to be engaged in e-learning although teachers were not trained in a pedagogy of e-learning

instruction and students were not ready for it and resources of online learning and internet connectivity were limited for many. Understanding the outcome of this learning would be useful for future preparedness and improvement for Hope Enterprise University College. In addition, the COVID-19 situation created a blended learning environment of e-learning and face-to-face classrooms. In line with the University College plan, the University College had the following situations in the semester:

- All classes had been running on e-learning platforms and students had a shortened semester of face-to-face classes to end the semester when the University College re-opened.
- The e-learning process was evaluated in a continuous assessment covering up to 60% of a semester evaluation in a non-proctor environment.
- Students then were evaluated in a proctored environment for the courses covered in e-learning contexts.

- Students were then evaluated for the remaining content of courses that they attended classes in a face-to-face environment.

In general, e-learning was introduced to the University College in these forms. From an educational perspective, the online mode of delivery is largely viewed by education professionals as equivalent to the face of classroom settings (Cavanaugh & Jacquemin, 2015). Despite this general approach, there were more constraints to transferring knowledge using E-learning platforms in an unprepared context like HEUC. This study focuses on assessing the differences between e-learning platforms and face-to-face classroom contexts. Comparisons of grade-based learning outcomes between online and face-to-face course formats have become essential given the growing use of e-learning platforms and the sudden closure of higher education institutions during the COVID-19 lockdown (Cavanaugh & Jacquemin, 2015).

The Objective of the Study

The study aimed at examining how learning experiences in the COVID-19 context contributed to learning outcomes and relate to the face-to-face learning experiences and assessments. The focus was on e-learning, student-instructor interactions, and student experiences of learning. Therefore, the following objectives have been developed to assess the overall learning experiences.

- To assess factors that affect students' learning in e-learning settings.
- To identify and compare student grade-based learning in e-learning and face-to-face classroom settings.

Research Methods

The literature supports the evaluation of the relationship between similar assessments such as online and face-to-face classes given that courses, learning objectives, and assessment methods are planned well. This is often witnessed by large datasets stating meta-analytic work spanning the past several decades. It has identified negligible to modest

differences in student performance between online and face-to-face course formats (Cavanaugh & Jacquemin, 2015).

Following the shutdown of the University College, 2500 students of HEUC were forced to switch their classes from conventional face-to-face to e-learning environments. More than 100 courses were given online in undergraduate and graduate classes. Most of the instructors who had tried to connect online were in most cases able to engage with at least half and in many cases at least 70% of classes in an online format. The most common e-learning platform that has been used in the University College is Telegram. Google Classroom, emails, and Zoom have also been used.

To achieve the intended objectives of the study, a total of 140 questionnaires were distributed to students in the graduate and undergraduate students of Hope Enterprise University College. Among those copies of the questionnaire filled in by the respondents and returned, 106 out of 140 (or 76%) copies of the questionnaire were filled correctly.

The instrument used was adapted from Yonas (2019) who made a similar study on the effect of e-learning in Ethiopian

higher education institutions. Four measures related to e-learning were selected for this study: learning factor, instructor factor, collaborative learning, and satisfaction of students with e-learning for this study.

In addition, a comparison of grade-based learning was conducted covering sixteen courses in six undergraduate and two graduate programs. The grades analysis looked into all the first-year students in the undergraduate programs in 2019/20 with a total number of 512 students and 181 students in first- and second-year classes of the MBA and Organizations Leadership in the graduate school.

Descriptions of the Sample

The table below shows the percentage of gender distribution, and males were (27.4%) while females were (68.9%). This shows more female students participated in the research.

Table 1: Gender of the Sample Study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	29	27.4	28.4	28.4
	Female	73	68.9	71.6	100.0
	Total	102	96.2	100.0	
Missing	System	4	3.8		
Total		106	100.0		

Questionnaire copies were returned from all departments although the proportion of respondents was not equally representative of the samples as some of the students declined to respond.

Table 2: Distribution of the Sample Population by Departments

		Frequency	%	Valid Percent	Cumulative Percent
Valid	Management	4	3.8	3.9	3.9
	Marketing	29	27.4	28.4	32.4
	Accounting and Finance	38	35.8	37.3	69.6
	IS& IT	7	3.8	3.9	73.5
	Architecture	11	10.4	10.8	87.3
	MBA	13	12.3	12.7	100.0
	Total	102	96.2	100.0	
Missing	System	4	3.8		
Total		106	100.0		

Data Analysis Methods

Multi-method and mixed-method research design had two phases following its exploratory and sequential approach (Hesse-Biber and Johnson, 2015; (Creswell, J. W. & Creswell, J. D., 2018) (Hesse-Biber & Johnson, 2015)

Creswell, J.W. and Creswell, J.D., 2018). A descriptive analysis of the instrument was used to see the overall evaluation of the online classes from the perspectives of students. Further analysis of the instrument was tested with a Chi-square test and there are differences in responses. Analysis was made on the qualitative data and the findings were summarized into four main themes that support the survey. Attempts were made to relate the findings of the survey to the grades of students in the first-year and graduate programs of HEUC. Studies on grade-based learning outcomes can be robust as they cover a large sample size, and apply academic and demographic controls (Cavanaugh & Jacquemin, 2015; (Faidley, 2018). First-year courses provided better academic control as they were largely similar and used comparable assessment methods. Regression analysis was used to predict the final exams by continuous assessments taught by the same instructors across different departments and sections.

Results and Discussions

The results of the questionnaire survey were analyzed using descriptive statistics. The results showed that the mean value is very low indicating that students did not highly approve of the sufficiency of the online classes during the lockdown. Likert scale analysis results for service quality dimensions showing mean values below average value 3 is those in which customers have perceived as low quality and these require more work in that area for improvement. According to Zaidatol & Bagheri (2009), a mean value score below 3.39 is considered low; a mean value from 3.40 up to 3.79 is considered moderate, and a mean score above 3.8 is considered as high.

The learning factor questions included whether students had access to computers and the internet and whether they were able to communicate with instructors using their devices (maybe computers or mobile phones). This factor of learning has a better mean value than others as students are largely familiar with the use of computers, mobile phones, and the internet, and (55 %) have positively responded. More female

students (37%) had more positive answers than male students (19%).

If we take the range of Likert scale values, the results show that the mean values didn't support a positive response for instructor factors, collaborative learning, and overall satisfaction with the online classes. The findings below reflect a range of low to moderate satisfaction levels of students during online classes.

Table 4: Descriptive Statistics of Student Satisfaction

	N	Minimum	Maximum	Mean	Std. Deviation
LearFa	105	1.00	5.00	3.6324	1.28126
InsFa	105	1.00	5.80	3.2481	1.03129
CollLe	104	1.00	5.00	3.2288	.95548
SatLe	104	1.00	5.67	3.4295	1.14501
Valid N (listwise)	103				

The instructor's factor includes class sessions that were creative and enjoyable for students, promoting

communication with students with supportive committees, and interacting frequently with students during the online classes. As shown above, these factors of the online classes were not positively received by students; they were within the range of low satisfaction levels. Most of the students disapproved of this service, as 21% of them stated that this service was not in good order during the pandemic while the mean results above show a low service score.

The collaborative learning factor refers to whether the courses were structured for online learning and whether there were enough supporting materials and social media to support the teaching-learning process. The shift to online classes was made suddenly and attempts were made to support the learning with the use of social media such as chat groups and sharing course materials with the use of telegram. As expected, this factor also scored a low mean value indicating a low level of service. The overall satisfaction of students during the pandemic was slightly better but fell under a moderate level of service quality

Chi-square Tests of Learning Factors on Differences in **Gender**

Further analysis was made to see if there were differences in the responses by gender by running chi-square tests. The results showed that there were no significant statistical differences between male and female students. Hence, a chi-square test of independence on learning factors revealed that there were significant differences in gender $\chi 2 = (8, 101) = 6.01) > .05$.

Similar results were found for the instructors' factor. The results showed that there was no statistical difference between genders. Hence, a chi-square test of independence run on instructor factors showed that there were significant variations in responses along gender lines $\chi 2 = (23, 101) = 20.59) > .0$.

The chi-square test didn't show significant differences in collaborative learning between genders. The test result is $\chi 2 = (18, 101) = 15{,}69) > .05$. Like the above, the student's

satisfaction chi-square test didn't show variation along gender lines $\chi 2 = (14, 100) = 17{,}24) > .05$.

Comparison of Grades of Online Classes with the Final Face-to-Face Exam Results

- Overall, online education is largely viewed by education professionals as being equivalent to instruction conducted face-to-face.

- Linear regression was used to predict the results of the final face-to-face exam on the bases of the continuous assessments given for the same courses by the same instructors.
- The review looked at the whole results of the first-year courses and MBA program to give a good sample size for the data.
- First-year courses were used as they are common courses to set the foundation for subsequent studies. Most of these courses are theoretical and similar kinds of assessment modalities were used.
- Mathematical and quantitative courses were included to see differences from other courses.

▪ Graduate program courses were included to see if the senior students fared better during the COVID-19 lockdown. Graduate students were also included in the survey and they evaluated the effectiveness of online classes during the lockdown.

The comparison of grades between the final exam and continuous assessments during the lockdown was used to see the impact of COVID-19 on learning assessments. Linear regression is used to compare grades. Linear regression was used for this analysis with the following formula (Field, 2017).

$$\text{Outcome}_i = (b_o + b_1 X_i) + \text{error}_i \; r_i = (b_o + b_1 X_i) + e_i$$

where Xi is the explanatory variable (the results of the continuous assessment online courses) and Y is the dependent variable (final exam results of face-to-face classes).

b1 is an unstandardized measure of relationships of predictor value and b0 is a parameter (the intercept). ε represents an error.

The linear regression line has an equation of the form Y = a + bX, where X is the explanatory variable (the results of the continuous assessment for online classes) and Y is the dependent variable (final exam results of face-to-face classes). The slope of the line is b, and a is the intercept (the value of y when x = 0).

The linear regression analysis was conducted on the first-year students' grades obtained during the lockdown and the final exam grades of the same courses in a face-to-face setting. The analysis reflects the relation between the two, and it is expected that the results of the continuous assessment during the lockdown would predict the final result. The linear regression tested two hypotheses:

- ***Ho***: The regression model doesn't fit the data (the continuous assessments don't predict the final exam results of the courses).
- ***H_1:*** The regression model significantly fits the data (the continuous assessments do predict the final exam results of the courses).

Linear regression analysis was conducted on the first-year students' grades during the lockdown season and the final exam grades of the same courses in a face-to-face setting. The analysis reflects the relation between the two and it is expected that the continuous assessment grades of the lockdown season would predict the final result. The results are mixed as the following table shows. The list below shows the courses and classes, and the tendency continuous assessment predicted the final result.

Summary of Findings

Table 5: Continuous Assessment Predicts Final Exam Results

No	Continuous assessment predicts final exam results	Beta	R^2	F	P-Value	Hypothesis Supported
1	Logic IS (N=19)	.289	.208	4.463	<.05	Yes
2	General Psychology IS (N=19)	.174	.538	22.128	<.05	Yes

3	Comm English IT (N=51)	.103	.152	8.955	<.05	Yes
4	Int Anth Acc (N=43)	.219	.378	34.594	<.05	Yes
5	Civics Acc (N=43)	.344	.105	4,807	<.05	Yes
6	Entrepreneurship Acc (N=43)	.377	.192	10,923	<.05	Yes
7	Basic Eng Arch sec 1 (N=47)	.293	.262	18, 448	<.05	Yes
8	Emerging Tech. Trans N=17	1,549	.17	37,268	<.05	Yes
9	Physics IT sec 1 (N=43)	.302	.379	25,547	<.05	Yes
10	Quantitative Analysis Mgt MBA YI (N=42)	.937	.112	5,155	<.05	Yes
11	Quan analysis Mgt MBA YII (N=32)	.901	.323	14,333	<.05	Yes

12	Organizational Leadership MBA (N=25)	.826	.319	11,219	<.05	Yes
13	Organizational Leadership N=31	,720	.261	9,564	<.05	Yes

Table 6: Continuous Assessment Failed to Predicts Final Exam Results

No	Continuous assessment failed to predict final exam results	Beta	R^2	F	P Value	Hypothesis
1	Project Mgnt Org. Leadership	.013	.000	.001	≥.05	No
2	Civics IT sec 1 (N=43)	.201	.036	1.601	≥.05	No
3	Com Eng Mark Sec (N=49)	.072	.032	1.551	≥.05	No
4	Math Mark Sec 1 (N=49)	.011	.001	.031	≥.05	No
6	Int. Anth IT (N=46)	.027	-.294	1.240	≥.05	No

7	Gen Psychology IT (N=46)	.083	.049	2.301	≥.05	No
8	Int to Entrepreneurship Mgnt (N=50)	.094	.036	1.824	≥.05	No
9	Applied Math IT (N=46)	.053	.003	.135	≥.05	No
10	Physics 101 IS (N=26)	-.017	-.238	.369	≥.05	No
11	Basic Engineering IS (N=22)	-.098	.017	.369	≥.05	No

The instructors' factors included class sessions that were creatively enjoyable for students, promoted communication with students with supportive committees, and interaction was frequent with students during the online classes. As shown above, this factor of the online classes was not positively received by students; it is within the range of low satisfaction level. Most of the students disapproved of this service as 21% of them stated that this service was not in good order during the pandemic while the mean results above show a low service score.

Chi-Square Tests of Learning Factors on Differences of Gender.

- If we compare the above tables, patterns suggested that course types and formats influenced the grade-based assessment of student learning.
- The continuous assessment of first-year theoretical courses mostly predicted the final exam grade results.
- On the other hand, the continuous assessments made on mathematical courses failed to predict the final exam results of face-to-face classes.

Also, in general, it is more likely that students with higher GPAs will achieve higher scores in classes regardless of the mode of delivery. If these variables were not included in the model, then a finding that online courses associated with higher grades could be confounded by a particular demographic or academic attribute of the students enrolling, and not because the course was being taught in an online vs. face-to-face format.(Cavanaugh & Jacquemin, 2015).

Independent T-test on the Exam Results

This research was an ex-post-facto study based on secure archived records ensuring a high degree of validity and reliability of the student outcomes measured as a final grade. Much of the research found in the literature review focused on a single semester with one instructor and small sample sizes or multiple locations with various instructors. Attempts were made to control variation by limiting the study to first-year students for two reasons. First-year students are new to the higher education environment and they take largely common foundation courses across all departments such as Logic, Civics, English, Mathematics, introduction to Social, Entrepreneurship, Physics, and General Psychology.

An Independent T-test was run to see factors that contribute to the inability of the continuous assessment to predict the final exam results. The grouping variables that were used to compare differences in grades were the availability of students' time to study, ability to understand online course content to organize and submit assignments on time, and whether they have received proper guidance about online

classes, availability of mobile phones or PCs to work on online courses, and confidence in using the internet and e-learning platforms for learning.

Further analysis was made by using nominal variables with a t-test to explore the factors that led to a failure in predicting the results of the final exam with continuous assessments. In seven of the 23 sections, a t-test result was used to test factors that influence grade-based learning assessment.

The first table presents mean differences between various groups' scores on the various coping modes. Results of independent t-tests, indicating the significance of the differences observed, are also presented (non-significant differences are not reported).

An Independent T-test was conducted to compare the availability of time that students had in their homes with the results of the final exam. There was not a significant difference in exam results between those who had time (M= 22, 13, STD = 5.17) and those who did not have time (M=21.14, STD= 9.76) conditions (t) 18=, 29, P= .82. in the department of Information Systems.

Further analysis was made to see if there were differences in the responses by gender by running chi-square tests. The results showed that there were no significant statistical differences between male and female students. Hence, a chi-square test of independence on learning factors revealed that there were significant differences in gender $\chi 2 = (8, 101) = 6.01) > .05$.

Similar results were found for the instructors' factor. The results show that there was no statistical difference between genders. Hence, a chi-square test of independence run on instructor factors found there were significant variations in responses along gender lines $\chi 2 = (23, 101) = 20.59) > .05$.

The chi-square test didn't show significant differences in collaborative learning between genders. The test result is $\chi 2 = (18, 101) = 15, 69) > .05$. Like the results above, the student's satisfaction chi-square test didn't show variation along gender lines $\chi 2 = (14, 100) = 17, 24) > .05$.

Comparing Grades of Online Classes with the Final Face-to-Face Exam Results

- Overall, online education is largely viewed by education professionals as being equivalent to instruction conducted face-to-face.
- Linear regression was used to predict the results of the final face-to-face exam based on the continuous assessments given for the same courses by the same instructors.
- The review looked at the whole results of the first-year courses and MBA program to give a good sample size for the data.
- First-Year Courses were used as they are common courses to set the foundation for subsequent studies. Most of these courses are theoretical and similar kinds of assessment modalities were used.
- Mathematical and quantitative courses were included to see differences from other courses.
- Graduate program courses were included to see if the senior students fared better during the COVID-19 lockdown. The graduate students were also included

in the survey to evaluate the effectiveness of online classes during the lockdown.

Linear regression analysis was conducted on the first-year students' grades during the lockdown and the final exam grades of the same courses in a face-to-face setting. The analysis reflects the relation between the two and it is expected that the continuous assessment results of the lockdown season would predict the final result. The results are mixed as the following table shows. The list shows the courses and classes that the continuous assessment predicts the final result.

Table 7: t-test Results of Categorical Variables and Final Exam Grades

Categorical variables	**Mean of final exam grade**			**Department**	**T**	**Df**
I couldn't deliver assignments on time.		N	Mean	Introduction to anthropology, Dep't of IT	2.19	44
	Yes	12	47.01			
	No	34	38.48			
I couldn't deliver assignments on time.		N	Mean	Communication English Dep't of Marketing sec 1.	1.97	48
	Yes	15	13.53			
	No	23	10.82			
I had no time to study during lockdown		N	Mean	Mathematics Dep't of Marketing	2.53	44
	Yes	13	17.69			
	No	31	14.39			
I had difficulty understanding the course materials		N	Mean	Physics Department of IS	2.13	23
	Yes	15	14.00			
	No	10	9.6			
I couldn't deliver assignments on time		N	Mean	Mathematics Dep't of Mgnt	2.35	47
	Yes	16	14.88			
	No	33	11.52			
I couldn't deliver assignments on time		N	Mean	Communication English Dep't of Accounting	-.2.26	39
	Yes	14	7.57			
	No	27	11.26			
I had difficulty understanding the course materials		N	Mean	Mathematics Dep't of Accounting	-.2.43	41
	Yes	22	14.09			
	No	21	17.48			

Qualitative Responses to Online Classes

The qualitative data was collected through open questions interviews with and observations from students and staff members of HEUC. The data reflected the main obstacles (noted below) in continuing education during the pandemic. The effect of the pandemic on education had not yet been discovered in terms of loss of knowledge and worsening the issues that we faced in delivering quality education in Ethiopia. The students identified these main challenges during the COVID-19 lockdown:

Poor Digital Environment

Online education was hindered by poor infrastructures including network, power, inaccessibility and unavailability issues, and poor digital skills. Students faced challenges due to power cuts and poor connectivity, and the cost of the internet was also a burden. Due to these challenges, organizing assignments and responding to exams was very hard for the students. The students stated these experiences as follows:

> *"Internet data payment for telecom is collaborating with COVID-19 in making it difficult for the learning environment. The cost we pay for internet service is an additional expense that we didn't anticipate."*

> *"Internet connection is poor. Sometimes ADSL internet disconnects for more than two days. On such days, it will be difficult to beat the time to deliver assignments & especially online exams."*

The Complexity of Course Types

Differences in the subject matter and infrequent contact between instructors and students were complained about by students. It was indicated that the complexity of courses varied for online delivery making quantitative courses difficult to understand. Students witnessed that it was very hard to understand mathematics in online classes and there was no one to explain it. A student stated:

> *"There was no teacher to elaborate* on *the course* note. *There was an assignment given without explanation"*

The Difficulty of Understanding Course Content and Doing Assignments on Time

It is very difficult to estimate how much knowledge was transmitted to students during the lockdown. Students were under the pressure of time in addition to the complexity of courses to discern without proper and frequent help from teachers. Students articulated the difficult times they spent learning during the online classes:

> *"The teaching-learning situation was bad because teachers were not able to help us as much as we needed them. Even when we had to submit our assignments late because of delays created by poor internet connectivity, instructors cut our marks. As IS students, we don't even learn Programming I well during the lockdown. So, when we start taking the next Programming II course, it will be hard for us."*

Low Interaction of Instructors with Students

The absence of face-to-face classes during the lockdown made students helpless when they needed help. This situation

brought significant challenges to student learning, and they had to work on their own and help each other when working on assignments. The frequent availability of instructors on the online platform to attend to and respond to students' questions is an important part of the learning environment, but these were not adequately addressed during the online classes.

> *"One of the main problems of learning is teachers were not available on online classes and they didn't understand the student problems."*

> *"It was difficult to get in contact with teachers and if I did contact them, their responses are not much useful."*

Loss of Motivation to Learning

The lockdown was not only slow in learning but also superficial as the focus was only on submitting assignments without understanding the course content. The simultaneous deadline of courses for submitting assignments within a short period created stress on the learning activities. Students focused on doing what was expected of them at any cost. Submitting assignments gave them little motivation to learn

and explore more in their area of study. The following student expressed this well:

> *"The learning and studying process is cold. Students learning interest and spending time studying their subject* have *decreased. They finished a chapter quickly. We were not gaining knowledge, nor were we keen on it. We studied only to* do the test well*."*

Implications and Future Directions

The findings strongly evidenced the negative impact of COVID-19 on learning. Although COVID-19 stymied learning, it also offered a chance to enact reforms and revamp education systems to respond to the growing learning crisis.

The study largely focused on first-year students but the challenges were more complex if we take into account the effect of COVID-19 on second, third, and fourth- and fifth-year students, particularly those students in the faculty of Information Science and School of Architecture.

The findings suggest that short- and long-term interventions are required to address quality issues that are compounded by the COVID-19 crisis.

Short-term

Extended research should be conducted to estimate the learning of students in various programs about the learning objectives, particularly on core courses related to specialization.

There is a need to take urgent action in the short term to restore the learning loss of students. Without urgent action, short-term learning losses could affect the next generation of students for a lifetime, with potential intergenerational consequences (Angrist et. Al, 2021).

One-month revision given for students when the University College was reopened had a positive effect but it was not enough. There is a need to provide short-term **remedial teaching and tutorial support** for students in core subject-matter courses.

Long term

Online education is **a paradigm shift** from teacher-centered teaching to largely student-centered activities (Rudrapati et al., 2021). In addition, higher education institutions need to build a resilient infrastructure that rebounds if another pandemic re-emerges. This requires sophisticated educational databases which act as a bridge between teachers and students.

In line with the directives given, the course structure needs to be reworked to make them convenient for blended online and face-to-face classes.

Infrastructure has to develop to properly handle and manage online classes. Higher education institutions are required to develop standard online education platforms for providing necessary access to students and teachers for high-quality education.

HEIs need to make online teaching integration part of their operations running fully online and blended online and face-to-face classes.

HEIs need to train and recruit specialized teachers for online teaching and support staff for providing the required support for teachers, students, and online systems. The online context of learning needs a novel approach to pedagogical methods and traditional training may not be useful for the current challenges (Vijayan, 2021).

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