The Effects of Online and Hybrid Teaching Practices on the Academic Performance of Engineering Students in Higher Education Institutions

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Abstract

In the current study, the researcher has analyzed the impacts of online and hybrid teaching practices on the academic performance of students in higher education institutions. The research provides a significant review of literature of the relevant past studies, in order to significantly cover the topic and also find out shortcomings and gaps in the previous research and studies. In this research, the researcher has implemented quantitative research method, deductive research approach, and positivist research philosophy resulting in detailed review of literature, hypotheses formulation, collection of primary data through survey and then quantitative analysis of that data with the help of the application of the tool SPSS and the correlation, regression, and ANOVA techniques. The impact of appropriate and comfortable places, extent of ease, online learning, online mode of course delivery, online classes attendance, reliance on the recorded sessions, enhanced concentration for the recorded lectures and recordings of the sessions for both hybrid and online courses on the academic performance of the students is significant. Furthermore, the impact of attending the classes along with watching the recordings has been found to be significant whereas, only watching the recording sessions has been found to be insignificant for impacting the academic performance of the students. The impact of only watching the recording sessions and problematic factors has been found to be insignificant for impacting the performance of the students.

Keywords
Online and Hybrid, Teaching Practices, Session Recordings, Academic Performance, Post-pandemic.

1. Introduction
Higher education institutes (HEI) around the world have been undergoing many changes and experiencing numerous obstacles in changing the educational system in the wake of the worldwidepandemic. Covid-19. HEIs are fully aware that the traditional delivery form of education will undergo a transformation to improve students' learning experiences through the use of high-tech means.

These developments had a variety of repercussions and reactions from various perspectives. This research examines the consequences and outcomes of distance learning and teaching via online media that occurred during the academic years 2019-2020 and 2020-2021 because of Covid-19's health restrictions. In this paper, the differences in learning techniques, students' perspectives on new teaching methods, and, most importantly, the impact these new methods have on students' learning and studying attitudes, will be examined. Furthermore, the efficiency and effectiveness of online teaching during the epidemic using real data will be assessed.

Data will be gathered through specially designed surveys which will be distributed to students to fill up in order to have

real life data emphasizing the details about students who experienced hybrid learning models during the pandemic and the difference in their academic performance as a result of the new models, compared to their achieved grades and academic performance during the normal conditions before the pandemic. Moreover, conclusions and analytical information will be extracted from the gathered data regarding the academic performance of students who relied on the recordings of the lectures in their studies compared to students who focused on the material during live lectures. The effectiveness and the efficiency of the whole education system has been affected directly by the new regulations and lifestyles adopted as a result of the pandemic and the contagious nature ofthe virus which forced quarantine and close down situations all over the planet at some points of time, thus altering many aspects of life such as the education system.

The point at issue to be analyzed and focused on is the direct alteration on high educational institutes students in particular and the educational structure in general due to the pandemic constraints and the newly introduced hybrid & online learning models. Different students'reactions to these modern restraints and conditions created a difference in their academic conductwhich in this research will be studied, analyzed, compared to the time before the pandemic, plus considering future relevant implications.

The main aim of this research is to evaluate and understand the effect of online teaching on the learning experience of students and how recorded lectures availability is reflecting on the students'educational experience when relying on the recordings thus reducing direct interaction during liveclasses. The objectives of this research can be explained as, to understand the effect of the pandemic and its new constraints on the performance of high educational institutes students, to evaluate the newly promoted learning and teaching models and assess their influence on the academic achievement of students and the performance of the educational system, find solutions to maintain high effectiveness and efficiency in the educational structure and to enhance HEI's students general educational experience and further investigate the educational system along with the health and pandemic situation and accordingly estimate long term plans with the aim of raising or maintaining high educational standards for HEIs students.
The limitations and constraints faced during this research can be elaborated as, less direct live visits and interaction with university students due to the covid-19, universities restraints. Ample diversity, as most of the students to participate in this study are of the same originsand cultural backgrounds. Since only 2 years have passed since the pandemic started, it will be challenging to makelong term expectations or applications.

2. Literature review
This chapter extensively reviews comparisons between traditional (face-to-face), online, and hybrid teaching practices as well as the strategies for post-pandemic teaching methods. The literature review also covers the advantages and challenges of providing the students with the session recordings in an online or hybrid teaching platform.

2.1 Overview of Traditional, Online, and Hybrid Course Delivery Methods
In recent years, technology has become increasingly important in all aspects of life. Its significance in education should not be underestimated (W. Ali 2020). E-learning is not a new notion in industrialized countries, but it is in developing areas where conventional classes are still quite important. In a traditional classroom setting, physical attendance to the classroom is required. This is the type of schooling that most people are accustomed to. On-campus learning has maintained the typical classroom experience for a variety of reasons (McDonald 2019). On the other hand, the online teaching process involves delivering the lectures and learning material to the students or the participants of the class on an online or virtual environment. Online learning is referred to as internet training, e-learning, virtual classrooms, Internet-based learning, online instruction, cyber studying, online classrooms, or web learning (McDonald 2019). Online learning, which is a subset of distance education that involves a wide range of technical applications and learning processes, includes computer learning, browser learning, online classrooms, and digital collaborations (Pearce 2018). It is also available in the form of complete. Hybrid learning, also known as blended learning, combines both online and face-to-face course delivery methods. By mixing delivery modes, hybrid learning aims to get the most efficient and productive educational experience possible.

2.2 Course Delivery Practices during CoVid-19 Pandemic
The Covid 19 outbreak has recently changed the entire dynamics of social institutions, and the educational sector has been significantly impacted. Agormedah et al. (2020) stated that over 90% of higher education institutions used remote learning during the COVID-19 pandemic. Universities, colleges are sites where thousands of young people make contact, making them susceptible to diseases. The education sector has continued to deliver knowledge and education

to the students irrespective of the multiple lockdowns; however, the tools, techniques, and methods have changed during this time significantly, which definitely has impacted the quality of the education and the learning abilities of the students as well. Universities were required to hold only online classes during Covid-19 that addressed not only technological concerns, but also instructional, institutional, content-based, and health-related reasons (Demuyakor 2020).

Education offered continuous learning without spreading COVID-19, simplified time and effort space in distributing course work, facilitated knowledge transfer and on-demand learning and gave teachers more flexibility in how they delivered instruction. However, interactions between instructors and students were difficult Higher education institutions provide more than just technological capabilities in the classroom; they also provide a space for students to "develop social interactions, teamwork, character development, and Management, learn about others, and participate in extracurricular activities and students' academic performance did not compromise.

Due to the CoVid-19 pandemic, both the students and teachers were relatively new to the method of complete online learning. Teachers have faced significant issues in the case of completely online learning methodology in comparison with the hybrid learning methodology.

During online learning, the most common problem faced by professors and students was a poor internet connection (Baticulon et al. 2021). During online teaching and learning, over 70% of students, 68 percent of faculty at state institutions, and 76 percent of faculty in non-governmental universities had connectivity troubles. Because they needed to access the site besides just university web servers to be ready for lectures and complete assignments, some students requested a free or subsidized data plan (Dhawan 2020). Highly determined students have even attempted to take additional online courses from world-renowned colleges via massive open online courses. Most internet service providers for higher education institutions gave free access to university web servers during COVID-19, which was crucial (Coman et al. 2020).

Some teaching and learning research studies demonstrate that they can assist teachers in making the transition from traditional to online instruction (Carruana Martín et al. 2021). More faculty receive institutional support for online learning in terms of internet access and methodological training in online teaching at higher education institutions (Agormedah et al. 2020).

2.3 Traditional vs. Online Course Delivery Methods

Students get a chance of meeting face to face and sharing their experiences and perspectives first-hand, it is frequently easier to form bonds and form communities with the peers and instructors (McDonald 2019). While community can be formed and developed in an online setting, on-campus courses facilitate the formation of relationships (El Said 2021). Even if the best tools are in place, it is still difficult to replicate the in-person learning experience in an online platform. There is more autonomy in a traditional classroom to practice information in a variety of ways. However, in an empirical study, researchers compared the differences between traditional and virtual learning environments, arguing that while traditional teaching environments are constrained by the location and attendance of both teachers and students, digital training and teaching environments are fluid and unconstrained.

Faculty members are required to engage in online distance education as part of normal obligations as faculty at numerous schools of higher education. Many professors, on the other hand, are unwilling to shift their regular classes to an electronic platform. This reluctance is linked to a lack of participation, guidance, and training from higher education institutions (Kew et al. 2018) Insufficient computer systems, poor internet connections, students' inattentiveness, teachers' lack of knowledge and skills, students' lack of preference, and teachers' lack of launch time to establish and style their online courses have all been identified as a barrier to faculty involvement in constructing and attempting to teach online classes.

Students in non-health sciences—such as architecture, computer engineering and/or information technology, management science, and law—preferred comprehensive face-to-face sessions and experiential learning. Preferences for legislation, education, and art history 50% of lessons are taken online, compared to 100% of face-to-face classes and laboratory instruction.

Beyond online education, instructors and students are concerned about the harmful impact of using technology too much. The faculty made extensive use of e-learning systems and webinars (Pearce 2018). The former was used for

course management, for example, creating lesson plans and uploading teaching materials as well as online instruction, and free time was used by many faculty members at universities of higher education. But even in a traditional classroom environment, there are smart technologies used these days.

Online learning may also enable students to perform part-time jobs to supplement their income and gain experience that will help them find complete work after graduating. The structured timetable you're obliged to follow weekly basis is perhaps the most evident downside of on-campus learning. When your class is only given, you must make sure you have that day free. This means that in order to commit to reaching your goals, you may have to sacrifice some things. If you're taking a class on campus, you'll also need to account for travel time from your place of employment or home to the site of your class. The second and most prominent advantage of this method of learning that has been pointed out by various studies involves the fact that online learning enhances the extent of motivation skills and self-discipline among the students while being at home.

2.4 Strategies for Post-Pandemic Course Delivery Practices
Although online learning provides a realistic substitute for the use of "physical" space, the necessity for teacher involvement in digital learning continues to be a significant concern for those schools that wish to continue offering distance learning (Dhawan 2020). Many schools are switching to hybrid learning because it provides more flexibility: a more flexible educational timetable, more flexibility in teaching modalities, more flexibility in how students interact with their educational resources, and more flexibility in communication and cooperation between classmates and teachers. Students who are unable to join classes in person can learn remotely from residence using the hybrid learning atmosphere (Demuyakor 2020). This atmosphere can be facilitated through recorded sessions provided by the instructors.

Furthermore, the evidence from the previous studies has also presented the fact that the outcomes and results of these students have been observed to be significantly disappointing as well, as a result of minimum communication between the students and the teachers. However, these shortcomings and gaps have been fulfilled in the case of hybrid learning, as a result of which, the students have been enabled to gain the experience of both online learning and class learning as well.

According to the feedback received by most of the students, it has been found out that at the level of higher education, there is a significant requirement of a learning technique or method, which is neither fully digital nor it is fully virtual for the students, whereas the students have some extent of control over the pace of the learning and the timing of the learning as well. In this case, the students have been observed to be getting the perfect blend of both the in-class experiences and the digital end online learning and helping materials, along with the required flexibility at the level of the higher education. Therefore, it can be concluded that hybrid course delivery method combines the advantages of both online and face-to-face courses.

2.5 Impact of Session Recordings on the Engineering Students Academic Performance
The CoVid-19 pandemic has changed education habits. It has become inevitable to avoid online teaching but at the same time continue completely on face-to-face teaching. As mentioned above, the hybrid teaching method compromised the benefits of both online and conventional classes. It has also become a common practice to record class sessions in higher education institutes. While the instructors could not easily embrace the idea of teaching online or hybrid, they have to record the sessions and share them with the students either via the student portals or via emails of the students. This new practice raised some concerns from the instructors' point of view as well as the academic performance of the students. Most of the students are dissatisfied with the video-based resources and materials that are provided since they think that these materials and aids are not able to compensate for the on-campus experience. However, in the case of hybrid learning methodology, it has been found that the problems and associated issues with the video and audio recordings of the lectures and helping materials are less compared to the online learning method. It is because of the fact that hybrid learning has been involving both the physical and in-class experience along with the online helping materials, learning experience, and the audio and video recordings of the lectures (Bhuyan 2021). The problems related to the queries, problems, and issues of the students are addressed by the teachers during the in-class experiences and face-to-face interactions.

While providing the students with the session recordings is helpful to enhance their learning experience and knowledge acquisition, they are prone to be absent in the live sessions which results in poor performance. This is due to the fact that there is minimal communication between the teachers and the students. The students have also found out that the

video and audio recordings are insignificant when it comes to the level of asking or the resolution of the different queries that the students might have.

Furthermore, according to another study, even for the courses for which the tutors have provided complete audio and video-based recordings, it has been observed that the performance has been relatively low in comparison with the pre-pandemic era, and these performance levels can be attributed to various factors (Gur 2021; Hrudok-Kostiushko et al. 2021). These factors involve the significant absence of the proper teacher and student interaction, at the higher level of education, the students are significantly curious, and the queries might be ignored by both the students and the teachers, given the fact that the students are learning and then re-learning with the help of the video or audio recordings. However, some of the students have found these materials and helping aids significantly assistive and helpful, as with the help of these materials, the students have become able to go through the lectures again and again during the pandemic era, without having the need to contact the teachers several times.

It has been found out by the researcher that a combination of hybrid learning and the students getting the audio and video-based recordings of the lectures and helping materials is more significant for the learning and development of the students at the level of higher education. These outcomes are attributed to the fact that most of the students that are learning online and getting the helping materials and video and audio recordings online as well have represented reservations regarding the ineffectiveness of the helping materials and the audio and video-based recordings as well. Moreover, the outcomes and results of these students have been observed to be significantly disappointing as well, as a result of minimum communication between the students and the teachers.

The results are inconclusive and mixed in the case of the previous studies, which is why this study is going to address the shortcomings and gaps of the previous studies while significantly focusing on analyzing the extent through which both online and hybrid learning methods have aided the learning of the students during the pandemic of COVID-19. Most of the students have been provided with the feedback that the teachers have provided with the necessary digital materials and the video and audio-based recordings via the student portals and also the emails of the students as well. However, even if the methodology is for both the online learning and hybrid learning methods are almost similar when it comes to the sharing of audio and video-based materials via emails and portals, there is a significant difference in the outcomes of both of these learning methodologies, which has been observed with the help of the outcomes of various studies. However, in different studies, the feedback of the students has been varying, and the feedback of the teachers has been found to be varying as well, in the case of providing the audio and video-based recordings and material to the students during the hybrid or online learning.

Literature review revealed that although there are advantages and challenges with different course delivery methods, the CoVid-19 pandemic has changed the old habits and forced the global to transform into digital platforms. In order to provide flexibility, it is concluded that the hybrid course delivery method can be considered as a compromised solution that addresses the needs of both parties: face-to-face and online course delivery. In that case, improving the academic performance of the students becomes essential. Recording the sessions when they are delivered online in a hybrid method, might or not enhance the academic performance. Literature review lacks such a distinction. Considering that hybrid course delivery gain more popularity in the coming years, the impact of different practices should be well researched such as the dilemma of providing the students with session recordings or not. Therefore, this research provides solutions to this dilemma.

3. Methodology
This section provides the details of the conducted research in to find out the impact of session recordings on the academic performance of the students from both the students' perspectives and the instructors' perspectives. A survey questionnaire was utilized to obtain the data. For natural phenomena, a survey questionnaire technique was adopted since it allows data to be gathered from individuals for whom the study is intended.

Online surveys obtain data from instructors and students in this research. There is a possibility that higher response rates may be achieved by having respondents' complete surveys online at their own speed and convenience. The first part of the questionnaire includes demographic data, such as gender, age, and educational achievement; the second section includes the study's variables. This research requires the creation of two questionnaires. Two questionnaires are designed to gather information regarding the influence of online and hybrid course delivery on the teaching experience of instructors and the academic achievement of students, respectively. According to a study, students were

asked 25 closed-ended questions, whereas instructors were asked just 16 closed-ended questions. On a likert scale of one to five, respondents may indicate whether they strongly disagreed or strongly agreed with each topic. More than 51 high educational institutes' students mostly from engineering departments separated between undergraduate and postgraduate students, averagely aged between 17 and 30 years participated in the questionnaires, which were from top different UAE universities, both males and females living all across UAE cities, around half of the participants had a full-time job, which was an important factor to study in this research. On the other hand, around 20 instructors from different top high educational institutes in the UAE, more specifically from engineering departments, participated in this research's questionnaire. Both male and female instructors averagely aged between 30 to 60 years with a medial teaching experience between 5 to 20 years.

3.1 Research methodology

The pandemic has not only impacted the overall methods of course delivery, feedback and ongoing activities of the classroom, but it has also significantly influenced the experiences of both the instructors and the students. Where on one hand the hybrid teaching methodology has its specific advantages over the online teaching methodology, at the same time, there is much to explore of the hybrid teaching methodology to implement and utilize it significantly and advantageously. This part explains regarding the detailed methodology of research and the course of action that is going to be followed in order to complete the processes related to the research under consideration.

3.1.1 Developing hypotheses

- Hypotheses regarding the performance of the student:
  H0: The impact of online and hybrid teaching on the academic performance of students is significant.
  H1: The impact of online and hybrid teaching on the academic performance of students is insignificant.
- Hypotheses regarding the experience of the instructors:
  H2: The impact of online and hybrid course delivery on the instructors' teaching experience is significant
  H3: The impact of online and hybrid course delivery on the instructors' teaching experience is insignificant
- Hypotheses regarding the session recordings experience:
  H4: The impact of session recordings on the instructors' teaching experience is significant
  H5: The impact of session recordings on the instructors' teaching experience is insignificant

The hybrid teaching methodology offers an amalgamation of both the offline and online teaching methodologies, including the specific significant characteristics that are offered by both the physical and online methodologies and set up of learning and teaching. Given the fact that the online teaching methodology has resulted in adverse experiences for the instructors, as a result of the lack of proper training, the lack of proper technological resources and the lack of the proper control on the classrooms, different institutions and instructors are significantly exploring the option of hybrid teaching methodology. As the experiments and trial classes have resulted in positive and significant influences and outcomes. Furthermore, different studies have also proven that the online teaching methodology has resulted in adverse experiences for the students as well, like lack of proper understanding, lack of proper feedback, lacking ability to properly interact with the instructors and lack of the proper explanations regarding the topics of interest. As a result of this, most of the students have lost the interest in the specific courses that are not offering the full potential in the form of the online classes, which is why, exploring the hybrid teaching methodology has become significant as well, so that the needs and demands of the students can be catered as well.

Various analyses were utilized to determine whether or not the present study's hypotheses were supported. Analysis of the instrument's dependability was carried out. In addition, demographic and variable-related descriptive analyses were conducted. The correlation was also done in order to examine the relationship between variables, while the impact among variables was checked in order to test the hypotheses and verify the link between variables by using multiple linear regression models. Analysis of variance ANOVA is used to compare the data. SPSS and Amos are used to assess the current dissertation's conceptual model or presented hypothesis, respectively. Using SPSS, the relationship between latent and observable variables was evaluated. SPSS provides a number of benefits. When it comes to statistical assumptions, one of the key benefits is that it is highly adaptive and versatile. These analyses are discussed in the next chapter. Both the null and alternate hypotheses will be tested by the researcher by analyzing the collected data, the collected data will be analyzed with the help of the application of ANOVA, correlation and regression analysis tools. As a result of the testing and analysis, for both the instances of the students and the instructors, one out of the null or alternative hypotheses will be accepted or rejected.

The regression analysis involves specific statistical processes, that are implemented on the data for the estimation of the relationships present between the independent and the dependent variables of the study. In this case, the independent variables involve online and hybrid teaching methods while the dependent variables involved the academic performance of the students and the teaching experience of the instructors. The correlation analysis is implemented on the collected data in order to find out that what is the nature of the relationship that exists among the variables, and it also represents the extent of the strength of relationship present among the variables. In other words, the nature, direction and extent of influences of the variables among each other can be defined with the application of correlation analysis. Furthermore, analysis of variance will also be applied, which involves specific statistical models and estimation procedures that will be applied for the analysis of the differences present among the mean values.

4. Data analysis and interpretation
This section presents the outcomes of the data analysis for the current research.

4.1 Correlation analysis
Table 1 is representing the results of the correlation, which represents that the correlation of the items with itself and with other items and factors are significant, like the association among OH8 and OH1-OH8, so, the data is sufficiently valid for further testing and analysis. The correlation values can be observed to be significant and positive for the data as well. This means that the variables are significantly and positively correlated with each other, and the data is sufficiently valid for further testing and analysis. OH8 represents Instructors' teaching experience, whereas Predictors (Constant) of Online and Hybrid teaching are represented by OH1 – OH7.

Table 1. Correlations

		OH8	OH1	OH2	OH3	OH4	OH5	OH6	OH7
Pearson Correlation	OH8	1.000	.285	.557	.493	.482	.685	.461	.701
	OH1	.285	1.000	.859	.801	.881	.792	.742	.776
	OH2	.557	.859	1.000	.655	.926	.878	.870	.842
	OH3	.493	.801	.655	1.000	.781	.833	.638	.852
	OH4	.482	.881	.926	.781	1.000	.843	.827	.889
	OH5	.685	.792	.878	.833	.843	1.000	.856	.920
	OH6	.461	.742	.870	.638	.827	.856	1.000	.711
	OH7	.701	.776	.842	.852	.889	.920	.711	1.000
Sig. (1-tailed)a	OH8	.	.185	.030	.052	.056	.007	.065	.006
	OH1	.185	.	.000	.001	.000	.001	.003	.002
	OH2	.030	.000	.	.010	.000	.000	.000	.000
	OH3	.052	.001	.010	.	.001	.000	.013	.000
	OH4	.056	.000	.000	.001	.	.000	.000	.000
	OH5	.007	.001	.000	.000	.000	.	.000	.000
	OH6	.065	.003	.000	.013	.000	.000	.	.005
	OH7	.006	.002	.000	.000	.000	.000	.005	.
	N	11	11	11	11	11	11	11	11

4.2 Regression analysis
The results of the regression analysis as shown in Table 1 are representing significant values as the value is less than 0.05, furthermore, there is a significant influence of the independent factors on the dependent variable by 89.6%. Furthermore, R square value and Adjusted R square values are also presenting the significant association among the dependent and independent variables as shown in table 2.

Table 2. Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.896[a]	.803	.459	.614	.803	2.336	7	4	.000
a. Predictors: (Constant), Online and hybrid teaching (OH7, OH6, OH1, OH3, OH4, OH2, OH5)									
b. Dependent Variable: Instructors' teaching experience (OH8)									

ANOVA

ANOVA in table 3 is representing that the model and the selected set of variables is significant as the value of significance is less than 0.05, at the df 7 and 4.

Table 3. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.160	7	.880	2.336	.000[b]
	Residual	1.507	4	.377		
	Total	7.667	11			
a. Dependent Variable: Instructors' teaching experience (OH8)						
b. Predictors: Online and hybrid teaching (OH7, OH6, OH1, OH3, OH4, OH2, OH5)						

Table 4. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.389	1.004		1.384	.002	-1.398	4.177
	OH1	-.957	.553	-1.242	-1.731	.000	-2.491	.578
	OH2	.989	.795	1.544	1.245	.000	-1.217	3.195
	OH3	.559	.683	.689	.819	.001	-1.336	2.454
	OH4	-.680	1.084	-.737	-.627	.565	-3.690	2.330
	OH5	.017	1.173	.020	.015	.009	-3.238	3.273
	OH6	-.256	.941	-.205	-.272	.000	-2.869	2.356
	OH7	.376	.764	.560	.492	.000	-1.746	2.498
a. Dependent Variable: Instructors' teaching experience (OH8)								

4.3 Detailed analysis of Students' responses
4.3.1 Model summary
Regression analysis is representing significant values as the value is less than 0.05, furthermore, there is a significant influence of the independent factors on the dependent variable by 89.2%. Furthermore, R square value and Adjusted R square values are showing the significant association among the dependent and independent variables. The results are representing that the impact of the independent variables on the dependent variable academic performance is significant which means that online and hybrid teaching both significantly impacts academic performance with a significant value of 0.000 as illustrated in table 5.

Table 5. Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.892[a]	.796	.731	.605	.796	12.328	12	38	.000
a. Predictors: (Constant), Online and Hybrid teaching (OH12, OH10, OH11, OH9, OH6, OH5, OH7, OH2, OH8, OH4, OH1, OH3)									
b. Dependent Variable: Academic performance (AP13)									

ANOVA

ANOVA is representing as shown in table 6, that the model and the selected set of variables is significant as the value of significance is less than 0.05, at the df 12 and 38.

Table 6. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.103	12	4.509	12.328	.000[b]
	Residual	13.897	38	.366		
	Total	68.000	50			

a. Dependent Variable: Academic performance (AP13)
b. Predictors: (Constant), Online and Hybrid teaching (OH12, OH10, OH11, OH9, OH6, OH5, OH7, OH2, OH8, OH4, OH1, OH3)

The outcomes of the correlation table are representing that the factors OH1, OH2, OH4, OH5, OH6, OH7, OH8, OH9, OH10 and OH12 have a significant impact on the dependent variable academic performance. Whereas, the impact of OH3 and OH11 is insignificant, as illustrated in table 7.

Table 7. Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-.035	.360		-.096	.041	-.763	.694
OH1	.248	.174	.241	1.425	.000	-.104	.601
OH2	-.033	.160	-.032	-.204	.000	-.357	.291
OH3	.102	.179	.096	.567	.574	-.261	.465
OH4	.404	.172	.388	2.344	.024	.055	.753
OH5	.207	.155	.218	1.332	.000	-.108	.521
OH6	-.457	.173	-.459	-2.637	.021	-.807	-.106
OH7	.360	.174	.363	2.073	.045	.008	.712
OH8	.062	.178	.056	.351	.000	-.297	.422
OH9	-.042	.110	-.042	-.381	.000	-.266	.182
OH10	.115	.088	.114	1.301	.000	-.064	.294
OH11	.067	.097	.061	.699	.489	-.128	.263
OH12	.096	.109	.088	.882	.000	-.125	.317

a. Dependent Variable: Academic performance (AP13)

4.3.2 Discussion

The impact of online and hybrid teaching on the academic performance of the students has been found to be significant which means that the "The impact of online and hybrid teaching on the academic performance of students is significant" (H0) the hypotheses regarding the performance of the students has been accepted. Moreover, the impact of the online and hybrid course delivery on the teaching experience of the instructors has been found to be significant as well, which means that "The impact of session recordings on the instructors' teaching experience is significant" (H2) has been accepted furthermore, the impact of the session recordings on the teaching experience of the instructors has been found to be significant as well .

The impact of appropriate and comfortable places is significant on the academic performance of the students, the extent of ease has a significant influence on the academic performance as well whereas, the impact of online learning has been found to be insignificant for the interactions of the students during classes. The impact of online learning has been found to be significant on the academic performance of the students whereas, the students have also responded that they prefer online mode of course delivery, so the impact of this factor is significant as well. The impact of problematic factors has been found to be insignificant for impacting the performance of the students. The impact of online classes attendance, reliance on the recorded sessions, enhanced concentration for the recorded lectures and recordings of the sessions for both hybrid and online courses have been found to be significant for that academic performance of the students. The impact of attending the classes along with watching the recordings has been found to be significant whereas, only watching the recording sessions has been found to be insignificant for impacting the academic performance of the students.

5. Conclusion

The research is significantly related to the higher education institutes, as this sector or area around the world have been undergoing many changes and experiencing numerous obstacles in changing the educational system in the wake of the worldwide pandemic. Covid-19. HEIs are fully aware that the traditional delivery form of education will

undergo a transformation to improve students' learning experiences through the use of high-tech means. The main objective of this research is to evaluate and understand the effect of online teaching on the learning experience of students and how recorded lectures availability is reflecting on the students' educational experience when relying on the recordings thus reducing direct interaction during live classes. The impact of extent of ease on teaching experience of instructors has been found to be significant as the value of significance is less than 0.05, the impact of attention, online learning and recordings are significant as well, as the value of significance is less than 0.05 as well. However, the impact of factors of problems is insignificant on the teaching experience of the instructors, as the value of significance is equal to 0.565. Furthermore, the influences of insecurity and recorded lectures on the experience of the instructors are significant as well.

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